

The Iron Age

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The Rasmussen Cable System for Street Railways.

A few weeks ago we had occasion to refer briefly to a new cable system for street railways which was recently put in operation on an experimental line in Chicago. We take pleasure in presenting in this issue engravings which very clearly illustrate it, representing general views, sections and details of the more important parts. It will be seen at a glance that the system is, in some respects, decidedly novel, a sprocket-wheel being used to impart motion to the car in place of the usual and unsatisfactory grip. The first patent on record showing the main idea of combining a sprocket-wheel with a moving chain in a shallow tube in the roadway was issued to Lafayette Parker, of Davenport, Iowa, in 1880. Then followed a series of inventions and designs patented by C. W. Rasmussen, of Chicago, between the years 1882 and 1885. In the winter of 1886 these patents were laid before Mr. Graves, of Dubuque, Iowa, and Mr. H. W. McNeill, of Oskaloosa, Iowa, who, after close investigation, concluded to take hold of the matter in a practical way, and the

The tube for the cable is $7\frac{1}{2}$ inches deep and 6 inches wide, and is made up of three pieces. The bottom plate consists of boiler iron, 12 inches wide and $\frac{1}{4}$ inch thick. The other two pieces, as shown in the section, Fig. 2, are each a Z bar of proper size, with 1-inch lugs rolled in the lower corners to carry cable trucks. When in place the

tube inside the rails, and a pipe attached running to a catch-basin sunk between the inside rails of the two tracks. From the basin connection is made with the sewers. A steel brush attached to the upper side of each traveling truck sweeps all accumulations into these basins; the liquids run into the sewers, the solid matter is lifted from the

The arrangement adopted will be more readily understood from Fig. 4, on page 27. Every 6 feet one of these buttons is widened from its center, downward, to form a journal and oil box, through which passes the axle that carries the wheels of the truck. This fastens the rolling two-wheel truck to the cable. At the engine-house a horizontal

tracks in the tube, the little trucks riding either lower or upper track as the case requires. At the outgoing side of the driving drum, in the engine house, the ordinary form of traveling drum, slotted, with compensating weight attached, is used to take up the slack of the cable. It will be noticed that the friction driving drum arrangement is an important step ahead. By setting this drum at, say, one-half the breaking strain of the cable, such a thing as breaking the cable becomes impossible. In case of any possible mishap, subjecting the cable to undue strain, the drum moves out of gear and the engine runs free. The rope runs $\frac{1}{4}$ inch clear inside of the edge of the slot in the tube, and the arms of the sprocket-wheel projecting into the tube, and catching the buttons on the cable, do not wear upon the cable at all. The patentees make the claim that there is no friction wearing point upon the cable at any place in the system, and its life can safely be guaranteed to be 10 years. Haswell gives the extreme stretch of $1\frac{1}{2}$ -inch wire rope hemp centered at $\frac{3}{4}$ inch six feet. This is in less than $\frac{1}{4}$ inch between the buttons, and is

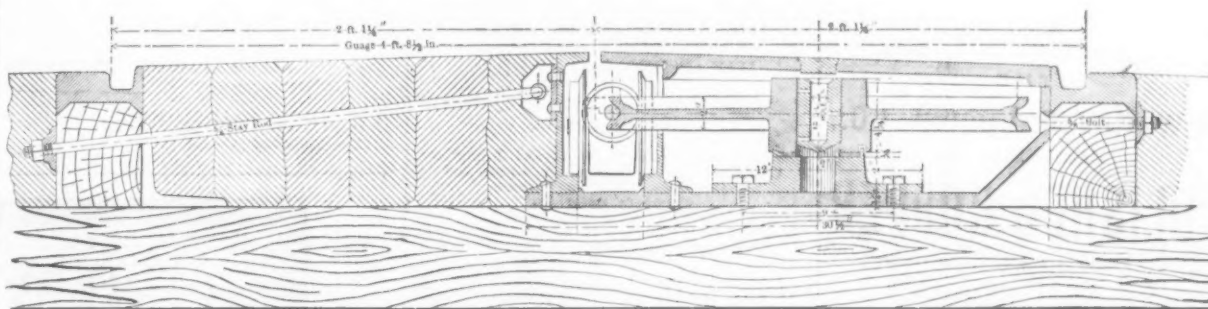


Fig. 1.—Cross Section of Curve Construction.

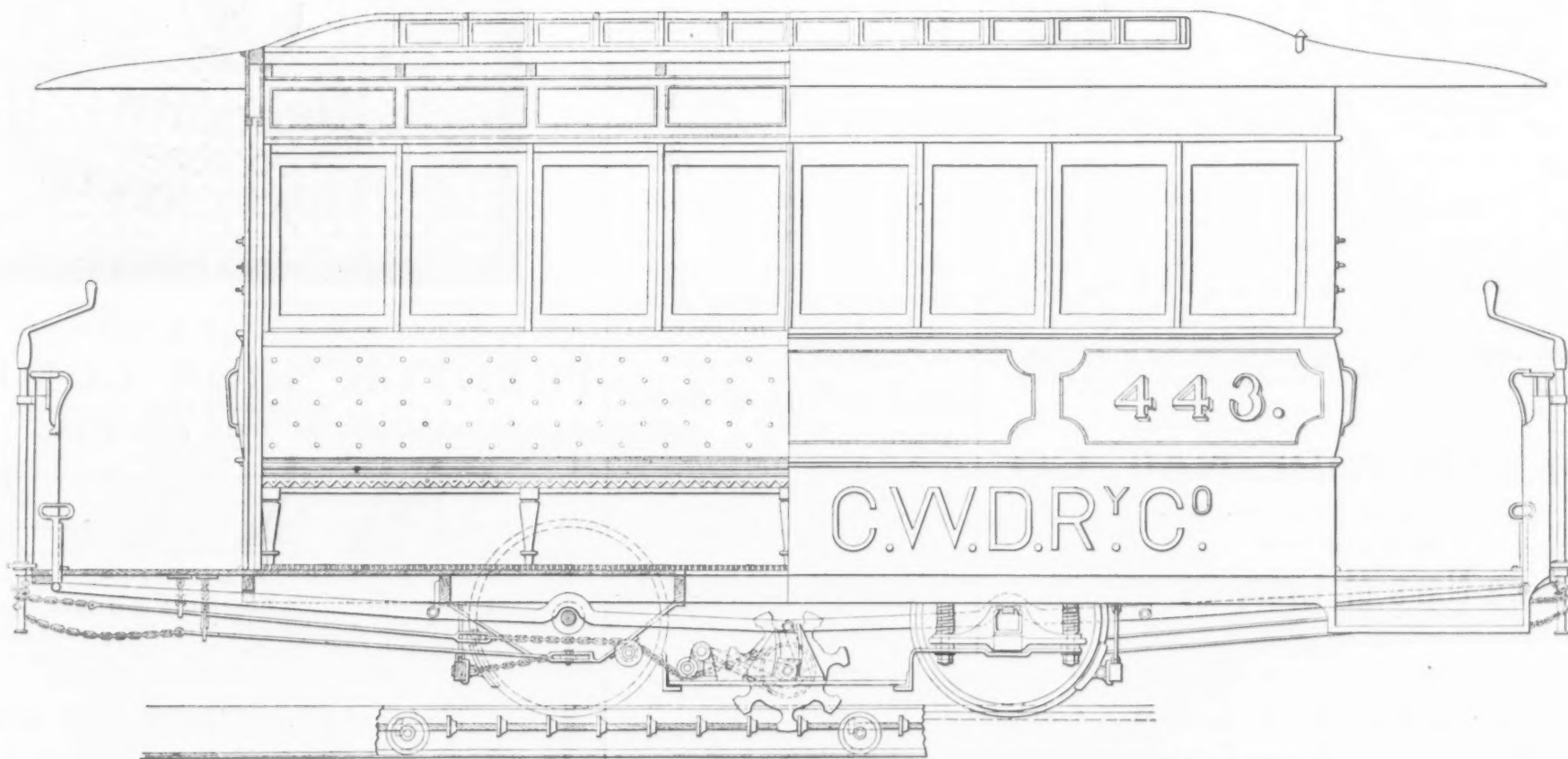


Fig. 2.—Side Elevation of Car, Showing Sprocket and Cable.

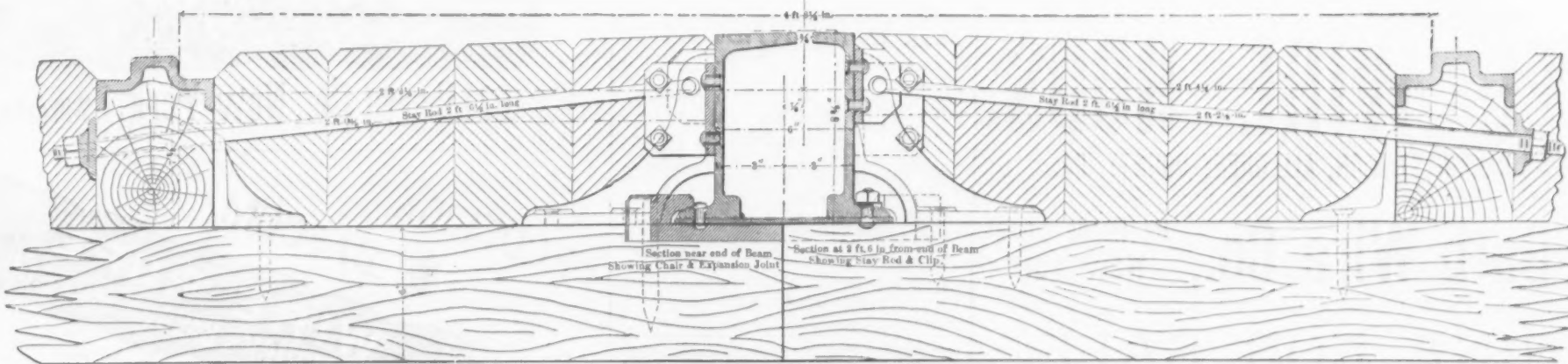


Fig. 3.—Cross Section, Showing Street Construction.

THE SPROCKET-WHEEL CABLE SYSTEM IN CHICAGO, BUILT BY THE RASMUSSEN CABLE COMPANY.

construction of a trial line on West Lake street, Chicago, was undertaken by them through the Iowa Iron Works Company, of Dubuque, Iowa. Working the ideas already advanced down into practical use developed the necessity for many new devices or improvements on old ones, which were designed by Mr. McNeill and secured to him in another series of patents. The result has been, after many months of hard work and the expenditure of a great deal of money, the experimental line to which we have referred, and which, while only a crude model appears to fully demonstrate the entire practicability of the system. Our engravings are from drawings for a new construction at Sioux City, Iowa, where the system has been contracted for by Messrs. Pierce and Hedges of that city.

upper flanges of these bars are of unequal width and do not meet, leaving a slot or opening in the top of the tube of $\frac{3}{4}$ inch at one side of the center. The large Z bar is riveted to the base plate, while the smaller one is bolted down from above, so that it may be removed. It is aimed in this construction to fasten the rails of the track and the tube to the same sub structure, so that their parallelism must be maintained; if one moves, all must move. The tube is built in sections of 30 feet, and the ends of the base-plate are fitted together in cast chair-plates; to the sides at the joints are riveted V-shaped plates, thus allowing for contraction and expansion. At intervals of about 300 feet, varying with the circumstances, a section 3 feet long is cut out of the bottom of the

basin in sheet-iron buckets placed there for this purpose. In changing an established line from horse-power to cable, the tube can be laid down in sections, working between midnight and 6 a. m., so that there need be no interference with the regular operation of the road, and hence no suspension of the revenue. The cable rests on and is carried by two-wheel trucks which we have already mentioned. These are 6 feet apart and move on two small tracks inside of the tube. The latter takes the place of only a small section of the pavement, and does away with extensive street excavation. For all ordinary traffic the patentees advise the use of a steel cable, wire centered, 1 inch in diameter. On this are fastened by compression, 8 inches apart, cast steel buttons $3\frac{1}{2}$ inches in diameter, 1 inch face.

Horizontal curvatures are made easy by the use of sprocket or arm wheels of small diameter, projecting through the side of the tube and reaching over to, and against the rope, so forcing the maintenance of alignment between the slot in the tube and the running rope below. Figs. 1 and 6, representing respectively sections and plan, clearly illustrate this. Vertical curvatures are taken care of by having upper and lower

allowed for in the slots cut in the face of the drums; the buttons acting as clamps reduce this possible stretch over one-half.

To transmit the motion without jar from the moving cable to a passenger car resting on track above it, an eight-armed sprocket-wheel of cast steel is constructed.

The web and hub of the wheel which is shown more clearly in Fig. 5 on page 27 are cast in one piece, with a flange projection from the side to carry a strap brake. Upon this are bolted the eight arms named, at such distances that the pitch line is exactly eight inches, to mesh into the running ratchet or buttons below on the cable, which are eight inches apart, and these arms project down and into the box five inches below

(Concluded on page 27.)

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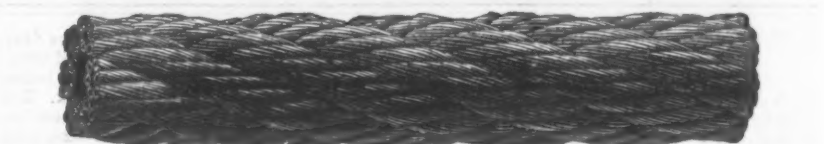
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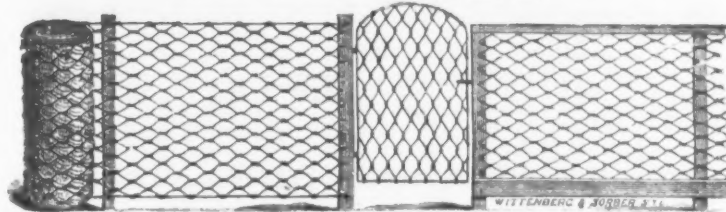


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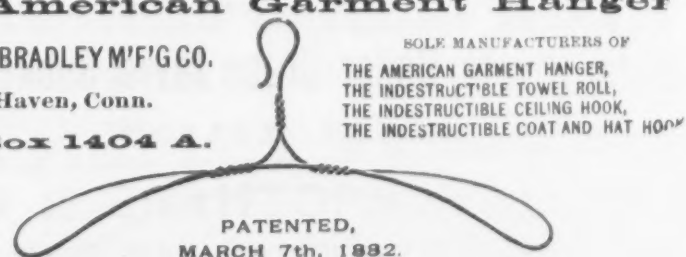
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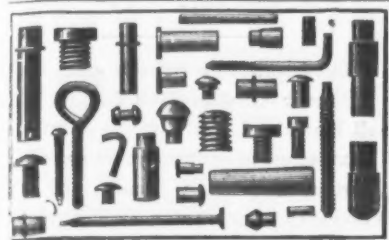
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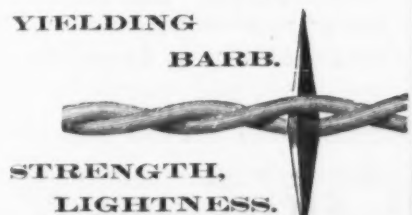
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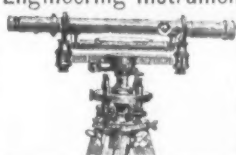
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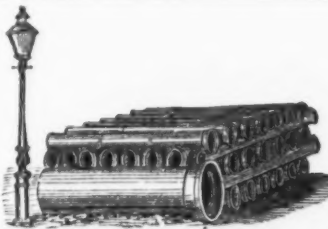
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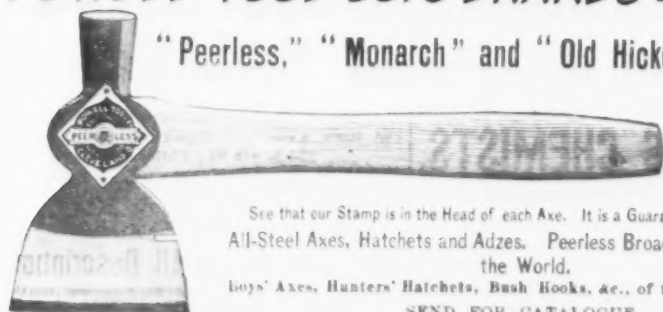
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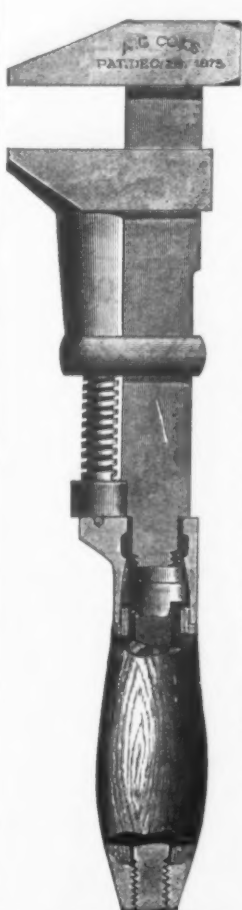
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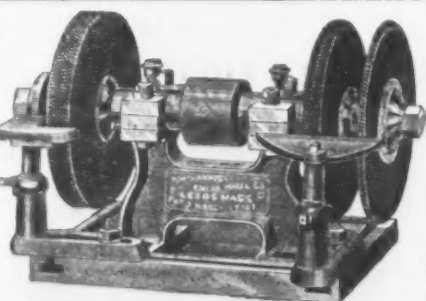
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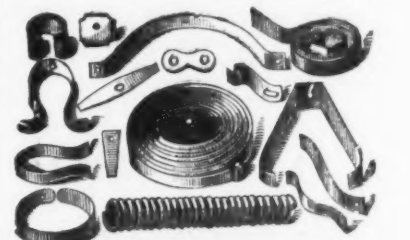
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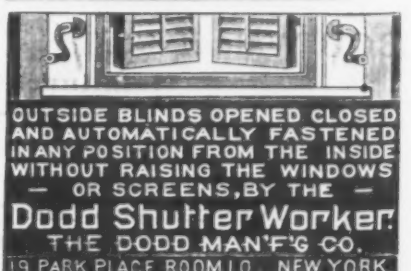


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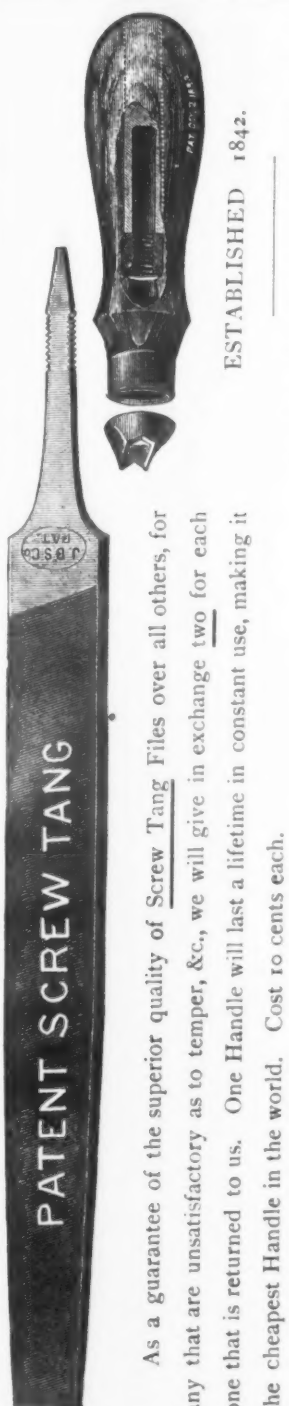
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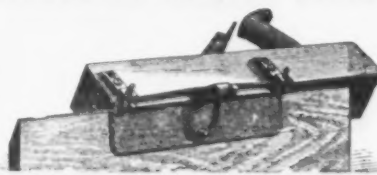
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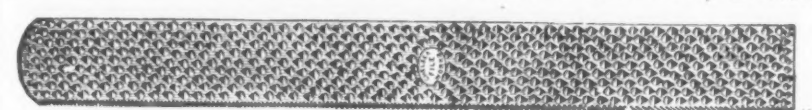
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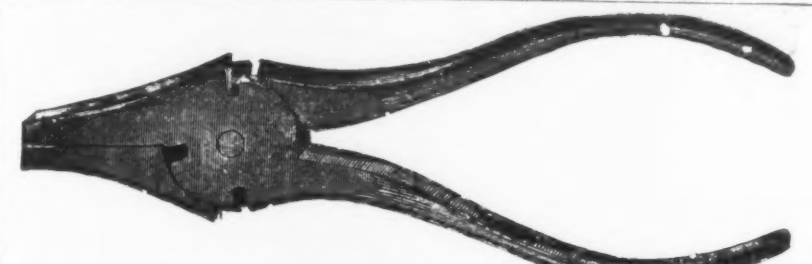
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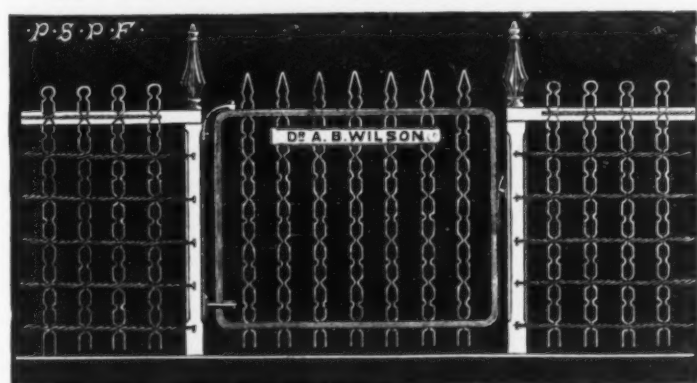
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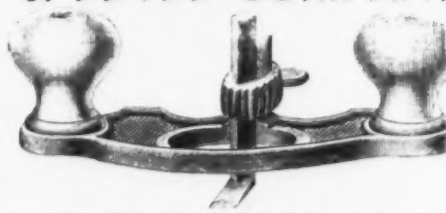
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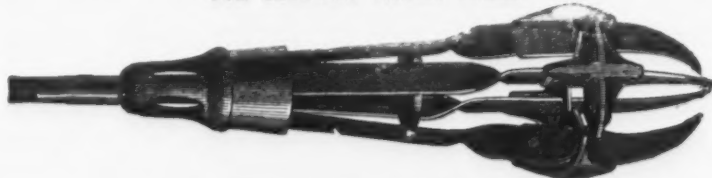
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WOOD-WORKERS' HANDY ROUTER PLANE.

This tool should be added to the kit of every skilled Car-
penter, Cabinet Maker, Stair Builder, Pattern Maker or
Wheelwright.
No. 71. Iron Stock, with Steel Bits (3/4 and 1/2 in.) \$4.50

THE NATIONAL STEEL TUBE CLEANER,
FOR CLEANING BOILER TUBES.



ENDORSED BY THE BEST ENGINEERS.

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419 East 8th Street, New York.

SWIFT RUNNING EMERY WHEELS.

THE ORIGINAL

SOLID VULCANITE

EMERY WHEELS

Runs Easy and Safe,

Cool and True.

Is More Durable — Hence Cheaper.

A trial will convince you of this.

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J. H. CHEEVER, Treas. Sole Manufacturers, 15 Park Row, New York.

Duplex Reversible Screw Driver.

TWO SIZES IN
ONE, AND AT
THE PRICE OF
ONE.



Send for Descriptive Circular and Price List.

C. THOMAS & CO., Manufacturers, BIRMINGHAM, CONN.

The Fastest Boat in the World.

The application of twin screws to torpedo boats is practically a new departure, for, although twin screws have been suggested and even used in fast launches capable of carrying a spar torpedo, they have never been adopted or even tried on a large scale in torpedo boats of the first-class. The more interest therefore attaches to the trial trip recently made in England of a twin-screw torpedo boat, one of two built for the Italian Government by Messrs. Yarrow & Co., of Poplar. Of this boat the London Engineer says:

The boat has the following dimensions: Length on water line, 140 feet; beam, ex-
treme, 14 feet; draft, 5 feet 4 inches; dis-
placement, 100 tons. Steam is supplied by
two locomotive boilers—one forward and one
abaft the engine room. Either boiler can
supply either engine or both. The screws
are driven by two pairs of compound engines,
indicating over 1400 horse power combined.
Condensing water is supplied by centrifugal
pumping engines, arranged to pump out
any compartment in case of leakage, while
ejectors and hand-pumps are fitted to each
of the main compartments. This boat is
fitted with no less than 10 water-tight bulk-
heads and Yarrow's patent water-tight ash-
pan arrangement to both boilers, by which
the fire is prevented being put out in case
of water entering the stoke-holes, and the boat
can run 50 or 60 knots after the stoke hole
is flooded, an advantage the importance of
which cannot be overestimated. Double
steam steering gear is fitted to work either
rudder quite independently of the other.

The armament consists of two bow tubes
and two at a very small angle with each
other on a turn table aft for side discharge
simultaneously, to insure at least one torpedo
hitting. She also carries two quick-firing
Nordenfeldt guns. Cabins are fitted for the
crew forward, petty officers right aft, and a
saloon, lavatories, &c., are provided for
officers further amidships. The weather
was rough, the number of people on board
33, equipment complete, and load carried 12
tons.

Steam pressure.	Vacuum.	Revolvs. per min.	Speed. Knots.	Mean. Knots.	Second mean. Knots.
135	27	375	22.641	24.956	24.186
125	27	364	27.272	24.816	24.921
120	28 1/2	355	22.991	24.816	25.026
130	28 1/2	370	27.682	25.026	25.026
131	28 1/2	372	28.390	25.026	25.026
132	28 1/2	364	27.692	25.026	25.026
Means 130	28 1/2	366	27.692	25.026	25.026

This is practically a speed of 25 knots, or
28 miles per hour. This is the greatest
speed ever attained through the water by
any ship or boat, and is a wonderful per-
formance.

The Manufacture of Molds for Casting.

Mr. Ralph Bagaley, of Pittsburgh, has
been granted an interesting patent, No.
357,303, dated February 8, for the manu-
facture of molds for casting. Mr. Bagaley
has, we understand, conducted a series of
tests before applying for the patent, which
have showed that at least for molding light
work the process will work well. It is reported
that Messrs. McConway & Torley, of Pitts-
burgh, will give it a thorough test shortly.
The general principle is thus described in
the patent specification:

In general foundry practice it is customary
for each molder to temper and sift the sand
he is to use and shovel and ram the same
into the flasks. These operations, which
consume the major part of the time, are
such as should properly be performed by
unskilled labor, and thereby allow the skilled
operative to confine his attention to such
work as necessitates skillful manipulations.
The object of the Bagaley process is to so
construct and arrange a molding apparatus
that such operations as sifting or tempering
the sand and the transferring and compact-
ing of the same within the flasks may be
effected by machinery or unskilled labor;
and, further, that the rapidity and order of
movements of the skilled operator may
govern the movements of the operator per-
forming the auxiliary work. In carrying out
this idea Mr. Bagaley proposes to avoid
the use of packers or rammers for com-
pacting the sand in the flask around the
patterns, and to attain the desired result—
i. e., a uniform density throughout the flask
—by permitting the sand to drop freely
from a considerable height into the flask.
Molds and cores have heretofore been
formed by dropping the sand from a con-
siderable height, but in such cases the sand
is sprinkled or dropped in separate particles,
and hence, as the air will present a consid-
erable resistance and the weight of the
individual particles is very small, the sand
will not drop with sufficient force to effect
the desired density. To overcome this diffi-
culty Mr. Bagaley proposes to compact the
sand, and while in a comparatively dense
mass or lump to permit it to drop into the
flask. Such a mass or body will be acted
on more strongly by the force of gravity,
and will not be subjected to so great an
extent to the retarding influence of the air.

Advices received at the Navy Department
from the Inspector of Steel at San Francisco
are regarded as highly encouraging. Lieu-
tenant Gilmer, who is charged with the duty
of inspecting the steel to be used by the Union
Iron Works in the construction of the
cruiser Charleston, reports that he has tested
some of the bars and other material turned
out by the contractors and found that they
blended beautifully, and he thinks that with
a little patience they will be able to turn out
as good material as there is made. It cer-
tainly shows excellently so far, says the
Lieutenant; it is as good as that made East,
and in some respects superior.

The Buckeye Bridge and Boiler Works, of
Cleveland, Ohio, made an assignment, on
the 5th inst., to F. J. Shaffer, for the benefit
of their creditors. The liabilities are \$35,-
000, and the assets are thought sufficient to
meet them. Their heaviest creditors are

Carnegie Bros. & Co., of Pittsburgh, Jer-
miah Miller, one of the leading owners,
attempted to commit suicide while tempo-
rarily insane.

Foreign Markets.

FRANCE.

PARIS, April 1, 1887. — *Metals.* — With the advent
of mild weather, the spring trade has opened with
tolerable briskness, there being a good demand
for metals at a slight improvement in Copper and
Tin, but a decline in Lead, Spelter remaining
steady. We quote at the close in francs per 100 kg.:
Copper, 102.25; Tin, 105.00; Ingots and
Slabs, 109; Best selected, 112.00; and Pure Copper
Ore, 106.25. Tin—Banco, 278.75; Billiton, 276.25;
Straits, 274.50, and English, 272.50. Lead, 31.75;
32.50, and Spelter, 48.50 to 50. In this city
prices for Merchant Iron and Beams have still
remained somewhat unsettled at between 14 and
15 francs. Old Rails at the same time declining to
8.50. In the Northern department there is a
steady market for Merchant Iron. Sheets are
worth 15 francs; rolling mills are fairly active;
Horsehoes are unsettled; railroad material is in
better request. In the Ardennes the revival is
not yet complete, although foundries are getting
on very well. In the Haute-Marne a good
run of orders has set in, prices tending upward
in consequence; foundries are also picking up,
but Hardware remains neglected. They quote
Merchant, 18 to 13.50, and Mixed, 14 to 14.50. In
the Meurthe and Moselle business still drags at
4.30 to 4.40 francs for Forge Pig, and 5.20 francs;
Foundry Pig is bringing 5.40 to 6.40 francs. More
favorable reports are reaching us from Saint
Etienne in Central France, where extensive
Government orders begin to spread animation.
—*Moniteur des Interets Maternels.*

BELGIUM.

BRUSSELS, April 1, 1887. — *Iron.* — Great firmness,
with a tolerably good demand are the charac-
teristics of the day, the situation being strengthened
by the handsome South-American and other ex-
port orders that have been dropping in during
the week. At Charleroi Pig Iron has exhibited
perhaps a little less firmness, yet this seems to be
merely the result of a temporary lull. There we
hear that Common Forge Pig has been sold at
130, which is a slight shading. Finished Iron has
been firmly maintained at 11 francs for Merchant
and 10.50 for Beams, while Plates continue bring-
ing 13 francs. The general aspect seems to be
reassuring enough in Belgium, although it may
not be brilliant. In some shape or other the
winter season has been weathered successfully,
and we now enter upon the spring campaign with
most of the work booked for months to come;
still prices, while being moderately remunerative
to the maker, are not high enough to be a check
on consumption or export. As at the same time
all political disquietude has vanished, consumers
are well disposed to even somewhat anticipate
their requirements. Under these circumstances,
ironmasters do not apprehend any very great lull
even during the coming summer. — *Moniteur In-
dustriel.*

GERMANY.

HAMBURG, April 1, 1887. — *Iron.* — In this
Westphalia, with but few exceptions, there has
been a fair amount of activity, combined with
growing firmness, with the exception of Forge
Pig in the Siegen district. But even the latter
begins to pick up again from the passing lull it
was subject to. Spiegel has been steady at 56 to
58 marks per ton for 12 to 13 1/2 Manganese and 54
to 56 for 14 1/2. Luxembourg Forge Pig continues
at the moderate figure of 12 francs per ton, and
Foundry at 52 to 50 francs for No. 3, none being
obtainable any more for delivery before July 1.
As for the rolling mill branch, most works are
busy, some of them very much so. Nobody thinks
that a decline is possible. Sheets continue wanted.
Wire Rods, which had been falling a little, are
in better request once more, and purchasers
willingly submit to the higher prices asked for all
Wire products. Dating from to-day, the price of
Cooking Coal has been raised in Upper Silesia,
and Pig Iron, so far rather low, is going to be en-
hanced in price in that district, involving a
further advance in Finished, which is quite active
there at 11.50 to 12 marks per 100 kg. Wireworks
in the district are loaded down with orders, the
demand continuing in spite of the appreciation in
value. Metals—Lead has remained as quiet as
before; this may also be said of Copper, while
Spelter displays great firmness under a tolerably
good demand. — *Borussenblatt.*

HOLLAND.

ROTTERDAM, March 29, 1887. — *Tin.* — During
the week a remarkably firm tendency has developed,
and, although the actual transactions may have
been restricted by the little Tin offered, a fresh
advance has been established, Banca, on the spot,
being worth 2.75 guilders, and from the coming
sale 62.50, while Billiton, on the spot, commands
62 and 62.25, for June delivery, 60 kg.—Koch &
Vierboom.

SPAIN.

BILBAO, March 19, 1887. — *Iron Ore.* — During the
week but few transactions have come to pass, al-
though the demand is still tolerably active, for
England in particular. That for France had so
far fallen off materially this year, but begins to
set in likewise once more; hence, there is a pros-
pect that as the year advances that country may
take as much as it formerly did. We quote Can-
pail, 7.6, and Rubios Superiores, 7 to 8. Ship-
ments have been steady over the Galdames,
Ortonera and Triano railways. Shipments so far
this year amount to 866,476 tons, against 781,308
some time last year. Pig Iron has been moving
off steadily, both for export and coastwise, total
shipments so far this year summing up 30,251
tons, against 22,936 during the corresponding
period of 1886. — *Bilbao Maritime & Commercial.*

AUSTRIA.

VIENNA, March 27, 1887. — *Iron.* — There has been
such a heavy snowfall during the month in Aus-
tria-Hungary that transportation and the Iron
trade have been hampered considerably. Advances
reach us from Hungary that at no previous time
has the demand for agricultural implements been
so large and pressing as is the case this spring, so
much so that some makers are looked all the way
to June next. At the same time the wages have
been rising and prices for the same have been
hardening. Iron does not move, but we quote
in florins per ton: Pig Iron, 38 to 40; Merchant
Iron, 105 to 122.50; Sheets, 14 to 17, and Beams,
112 to 117. Metals—There being a lack of activity,
the market is less nervous than they were the previous
week. We quote in florins per 100 kg.: Copper, 52
to 53; Lead, 17.50; Spelter, 19 to 20; Tin, 110 to 112.50;
Antimony, 36.50, and Quicksilver, 24. — *Hundels-
Journal.*

CHILE.

VALPARAISO, February 11, 1887. — *Copper.* — The
market opened a fortnight ago at \$15 1/2, advanced
to \$17 1/2, and finally wound up at \$16 1/2. 12,000
quintals changing hands at \$16 1/2 to \$17 1/2. The
closing price of \$16 1/2 equals a 2 1/2 per cent. and 37 1/2
freight per steamer to Liverpool, combined with an
exchange of 24 1/2. Nitrate. On the 28th inst.
there will be a refiners' meeting at Iquique, when
it will be determined whether the present com-
bination is to be prolonged and on what terms.
Pending the result, dealings have been restricted to
222,500 quintals at \$2 7 1/2 to \$2 8 1/2 per quintal
for 6 per cent. the closing price being \$2.60 for
65 per cent., equal to 7 1/4 per cent. in England. The
January export has been as follows:

	1887.	1886.	1885.
To the North of	Quintals.	Quintals.	Quintals.
Europe	107,830	103,029	101,427
To the Mediter- ranean			
To the United States, on the Atlantic	64,298	23,241	106,330
To the United States, on the Pacific		36,000	17,486
Total	172,128	126,270	225,243

There were loading on the 1st inst. 273,000 quintals,
against 305,000 in 1886. January charters for
Europe amounted to 14,000 tons, and for the
United States 2200. Goods have been looking up,
especially abroad, and we quote Newcastle, West
Hartley, 25 on the spot, 20 December shipment
and 20 January shipment, Australian command-
ing 25 on the spot. Exchange—Ninety days, Lun-
don, 25 1/2. — *Weber & Co.*



NEW YORK OFFICE
97 Chambers Street.
NEW REVERSIBLE GUARD RAZOR
MADE BY THE J. R. TORREY RAZOR CO., Worcester, Mass.
is Razor is used in the ordinary manner, with or without the guard. When used with the guard it is impossible to cut the face in shaving.
It is the only Practical Safety Razor made.
SEND FOR ILLUSTRATED CATALOGUE.

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Olson File Co.'s Files
Russell Jennings' Auger Bits,
O. Selor & Co.'s Hatchets, Hammers, &c.
American Screw Co.'s Wood and Mac. In-screws,
and all size Bolts, Rivets, &c.

Brade's Brick Trowels,
A. Field & Son's Tacks, Brads, Nails, &c.
O. Ames & Son's Shovels, Spades and Scoops,
E. W. Gilmore & Co.'s Strap and T. Hinges.

GENERAL HARDWARE.

DAME, STODDARD & KENDALL,
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FINE FISHING TACKLE
OF EVERY DESCRIPTION.
SELLING AGENTS FOR

Skinner's Celebrated Fluted Trolling Spoon Baits.
Patent Adjustable Floats and Sinkers.
Nason's Patent Portable Net Ring and Staff.
Crosby's Hunting Hatchets and Camp Axes with patent covers.
Globe Braided Silk Linen and Cotton Lines.
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The "Isaac Walton" Fishing Suits.

Manufacturers of Lancewood, Greenheart and
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Successors to BRADFORD & ANTHONY,
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QUALITY
UNEXCELLED.
DIAMOND EDGE
SHEEP SHEARS
New Take the Lead.
SEND ALL ORDERS AND INQUIRIES FOR Sheep Shears TO Holyoke, Mass.
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Cutlery Co.,
84 & 86 Chambers St., N. Y. City.

A. FIELD & SONS,
MANUFACTURERS OF
WIRE NAILS
of Every Quality and Description.
Taunton, Mass., & 78 Chambers
Street, New York,



Clayton Brothers,
BRISTOL, CONN.,
Manufacturers of **Cast Shears**,
new Drivers, Kitchen Knives, Roller Skates, &c.
The Best and Cheapest in the Market. Send for Prices.

SCREW DRIVERS
OF ALL KINDS
A SPECIALTY.
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HARDWARE SPECIALTIES,
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Manufacturers of
Sleigh Bells, Hinges, Tea Hand, Gong Bells, &c.

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MANUFACTURED BY
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Forged from Bar Steel and Tem-
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We Challenge Competition for Cutting and Wearing Qualities.
THE FINISH AS GOOD AS THE BEST.
We Expect to Lead and you cannot afford to lose a chance of keeping
posted on the improvements of the age. Get our Prices and then try a sample order.
Your customers will compel you to order again. Address, with name of paper you saw this in,
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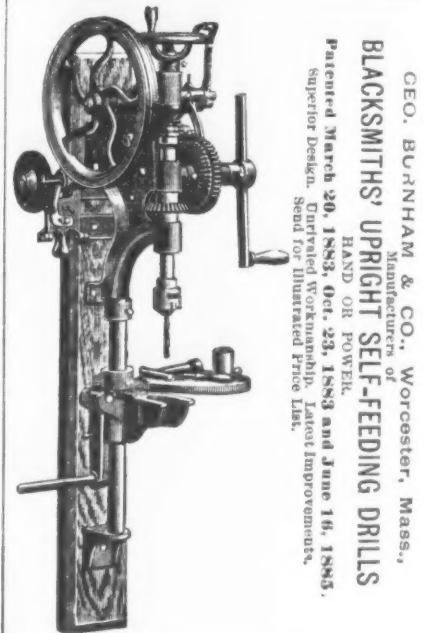
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ROCHESTER, N. Y.,
MANUFACTURERS' AGENTS FOR
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FINEST CRUCIBLE STEEL. BEST MALLEABLE IRON.
LIST PRICE:
1,000 pounds Capacity, \$4.75; 2,000 pounds Capacity, \$6.00; 3,000 pounds Capacity, \$7.00; 4,000 pounds Capacity, \$8.00; 5,000 pounds Capacity, \$9.00; 6,000 pounds Capacity, \$10.00; 7,000 pounds Capacity, \$11.00; 8,000 pounds Capacity, \$12.00.
BRASS GOODS MFG. CO.,
Manufacturers of Stamped Brass, Silvered and Tin Goods, Hyatt's Patent Brass and Iron Spring Bolts,
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Illustrated in an eighty-eight page book, which will
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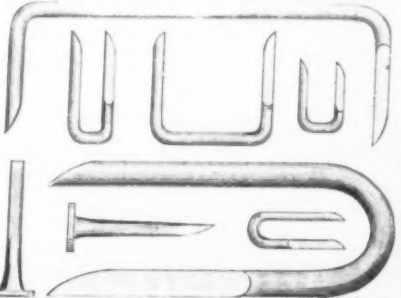
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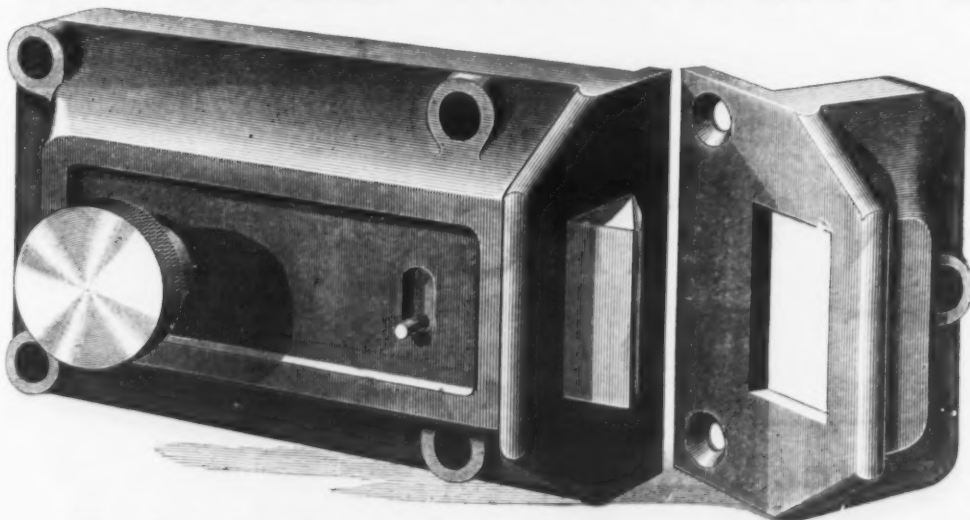
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English Letter.

(From Our Regular Correspondent.)

LONDON, March 28, 1887.

This week has been a very quiet one in almost all directions, and I see no early prospect of any considerable change in either direction. You will doubtless notice that the *ironmonger*, of London, and other British journals are apparently puzzled by the aspect of your market, and no doubt express the views of the members of the trade on this side the pond when they express the hope that the activity of your market may speedily become more pronounced. By the most recent advices, however, I gather that you are rather quieter, if anything, and that there is little or no likelihood of any early advance in values. This relapse on your side is unquestionably disappointing to our people, and if your market does not move up almost immediately I shall not be in the least surprised to witness a shrinkage of values here until very little better than the prices ruling in July and August last are again reached. In forming this expectation I am not losing sight of the happenings of more than one recent year. It has occurred several times within the past decade, and as similar causes are generally at work in the same directions it is probable that what has happened before will take place again. In November and December there have been symptoms of improvement, and values have shown a tendency to stiffen. Just a short time before Christmas this tendency has been emphasized, and in the early part of January a distinct spirit has been felt in pig iron and old materials, as well as in Bessemer blooms and billets. January has been lively and also the early portion of February, but in March there has been a relapse, and that month, as well as April, has been very "touchy" and weak. Then prices have gradually dropped, with occasional flushes, until about the middle of May, when there has been a little change for the better, to be followed by dull doings in July, August and September, after which the iron trade barometer has run through another gamut of the same kind. This year we certainly thought there was likely to be an exception, owing to the buoyant reports from the United States and the expectation that extensive railroad building would set everything on the boom. Having indulged in this anticipation, the disappointment is all the more keenly felt by many speculative gentlemen here. Apart from those who have pinned their faith on the more stirring times thus promised, however, it must be said that there is a general feeling of disappointment, and that notwithstanding the fact that there is more work in hand now than there has been at the same period for some years past. Further, there can be no doubt that the months of January and February were really characterized by much activity, and, of themselves, will do much in the way of leavening the yearly returns.

In the metal market there has been more attention paid to copper and tin for some reason not very apparent to the public eye, but ostensibly on the strength of lessened production and increased consumption. Copper has been speculatively bought on the strength of what are called favorable reports as to the Montana, Anaconda and other American mines. These reports have tried to make it appear that your supplies are run short, but so far as my information goes I see no reason for believing that such will be really the case. As to tin, nobody outside the ruling ring can say what may happen; consequently all vaticination would be worse than useless, and probably misleading, to boot.

SCOTCH PIG IRON

is irregularly dull, and has been down as low as 42/ for warrants since I last wrote to you. It is now a little better in the open market, but is still flat. A year ago warrants were 39/.

In Connal's stores there are now 553,899 tons (an increase of 4874 tons last week), as against 711,437 tons this date (1886). There are now 75 furnaces (49 on ordinary pig) at work in Scotland, as compared with 96 a year back. Shipments to date this year are 11,405 tons ahead, while the imports of Middlesboro' pig into Scotland are 7476 tons ahead to date this year.

MIDDLESBORO' PIG IRON

is without particular changes to note in the open market, as regards makers' brands, but warrants are being knocked about a great deal and have been done to-day at 33/9 or 34/.

HEMATITE PIG IRON

is quiet, and is being subjected to under-selling by merchants, some of whom are believed to be operating on behalf of American principals, who find it will pay them better to sell than to ship. Warrants to-day are 44/ or 44 1/3.

There are 52 furnaces at work, against 44 a year ago. Stocks in stores only have increased by 37,116 tons since Christmas, 1886.

WILLIAM JESSOP & SONS, LIMITED, SHEFFIELD

At the annual meeting of shareholders of this company, held last week, Mr. Thomas Jessop, the octogenarian chairman, was present, and made some rather interesting remarks. He said he could only repeat the remarks that he made last year as to the great depression in trade, particularly in the early part of 1886. At that time he was afraid they would be hardly able to pay a dividend, but toward the end of the year they had a "spring" as it was called, and trade became better. They received some very good orders from America for their old-fashioned steel, but the difficulty and trouble they were laboring under was the low prices which they had to sell at to compete with the market. The American manufacturers themselves seemed determined that they would have the trade if possible; but notwithstanding that it appeared to him that during the year some of the people had come to their senses and the thought they would rather fall back on English steel, particularly if they could get it at a low price. They had endeavored to do the best they could. There had been every attention paid by all the chief men in the establishment, and he had paid a little attention himself.

and he thought altogether they had done fairly well. He regretted to say they felt there was a little falling off just now. The orders were not so large, and did not come so often. He was afraid that was not only the case with them, but with some of their neighbors.

THE IRON MARKET

remains quiet. Shipments from the various ports, taken in the aggregate, are better than they were for the corresponding period of last year. With the opening of ports, still closed, it is but natural to assume that further improvement will be manifested. Another important feature at the present moment is the reluctance of makers to sell, especially for forward contracts. Where makers have entered the market it has been chiefly with small parcels for immediate delivery. Purchases for the United States, though apparently few at the moment, are still being quietly proceeded with, and it is rumored that some large parcels are about to be secured for Transatlantic delivery. Glasgow warrants have shown a declining tendency, with an occasional rally, and closed at 42 1/4 per ton. Hematite pigs on the West Coast have been dull, and warrants there have receded to about 45/.

Makers' brands are fairly firm at about 46/ or 46 1/6 for mixed lots, although from second holders easier terms have been secured. In Cleveland there has been a minimum of business, with rather weaker rates, a trifle below 35/ having been accepted for No. 3 G. M. B. In most English districts sheets are flat, and some of the mills are becoming slack. This condition is attributed to the non response of Australia to the spirit in the market recently experienced, so that as against a rise of about 15/ for galvanized sheet which ruled a few weeks ago, only about 7/6 can now be reached upon the lowest point touched last year. A steady business has been done in bars. The bulk of the business has been in common grades. Hoops and rods have altered in no respect, nor have transactions in angles and tees been more than fairly good at late values. In heavy wrought work some large inquiries are out, chiefly for India. Of old iron rails and scrap moderately good sales have been made, old double heads being quoted at 65/ and heavy wrought scrap, at 61/6 or 62/6, both rates c.i.f., net cash, New York. Freights for pig iron from Glasgow to New York by ordinary steamer have ranged from 6/6 to 7/6 per ton. Steel continues to be well inquired for, and prices are firm. The lighter departments show an improvement, and a cheerful tone prevails without. The Indian States lines and several Indian private railway companies are asking for a quantity of steelwork for bridges and other purposes. There is no inquiry for sleepers at present, but it is believed that several orders are about to be given out. Blooms for the United States are in fair demand, though they are not keenly sought after. Buyers have been trying hard to induce makers to accept lower rates than £3. 17/6 per ton, but sales on such terms have not been made known. Siemens-Martin billets are quoted by John E. Swan & Bro., Glasgow, at 95/ or 100/ f.o.b. Glasgow, and are from 82/6 to 85/ f.o.b. Middlesboro', as low as 80/ being mentioned in some cases. Steel rails are quiet, only one specification of importance being before the market just at the moment, that one being from the Great Northern Railway Company. The order for the Madras Railway Company has not yet been given out. About £4. 7/6 per ton for standard sections is the current quotation, but as no contracts have been made during the week there has been nothing with which to check it. The American demand is quiet, apparently dead.

A Monastic Fleet of Steamers.—According to a Russian newspaper, an engineer from the White Sea has just arrived at Motain, in Sweden, to take over a steamer that is being built for the monks of Solovetsk. This vessel will make the sixth steamer belonging to the monks, who use them to convey to their monastery the 30,000 pilgrims that annually repair to the place. The monastery is situated on the largest of the three islands forming the Solovetsk group. The island measures 15 miles in length by 10 in breadth, and is only accessible from the middle of May until the middle of September. During this period steamers owned by the monks run regularly to Archangel and back, charging very little for the double voyage, and in the case of very poor pilgrims, nothing at all. Each pilgrim, moreover, according to ancient custom, is boarded and lodged for nothing at an inn belonging to the monastery. Besides its shrine, Solovetsk is famous for its mines of talc, large quantities of which are exported to Russia and abroad. A peculiar feature about the Solovetsk steamers is that they are all manned by monks, and commanded by monastic captains. The mainmast of each steamer is surmounted by a golden cross. In the time of Peter the Great the walls of the monastery were defended by 90 cannon, and during a rebellion against the Government sustained a siege of two years. During the Crimean War the monks claim to have driven off the English fleet by firing some of the old cannon remaining, and marching in procession round the monastery walls. Although the fleet owned by the monks does not pay expenses, the offerings of the pilgrims make up for the loss, the monastery being one of the wealthiest in Russia. At present the number of monks exceeds 200.

The new steamship *Olivette* built by the Cramps, of Philadelphia, to run between Tampa, Key West and Havana, will sail in a few days. She is an iron vessel, 300 feet in length, with triple expansion engines of the most modern type, and is expected to attain a speed of 16 knots per hour. The cylinders are 23, 36 and 60 inches diameter by 36 strokes. She has four return flues, Scotch boilers, with a large auxiliary or donkey boiler.

Oil in paying quantities was found at Warren, Ind., on the 31st ult., at a depth of 634 feet. The discovery has caused a great deal of excitement in that locality.

H. D. SMITH & CO.,

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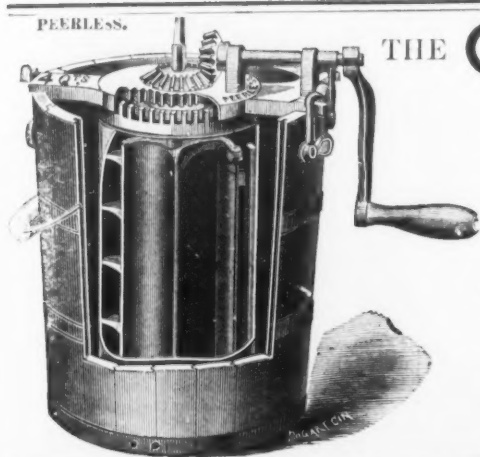
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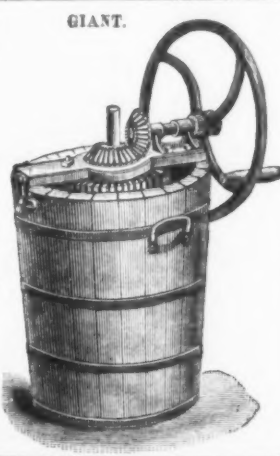
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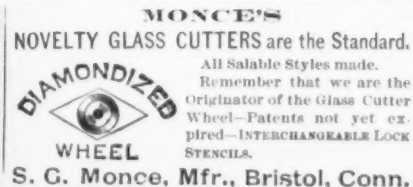
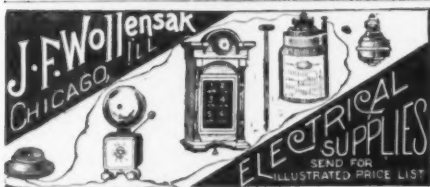
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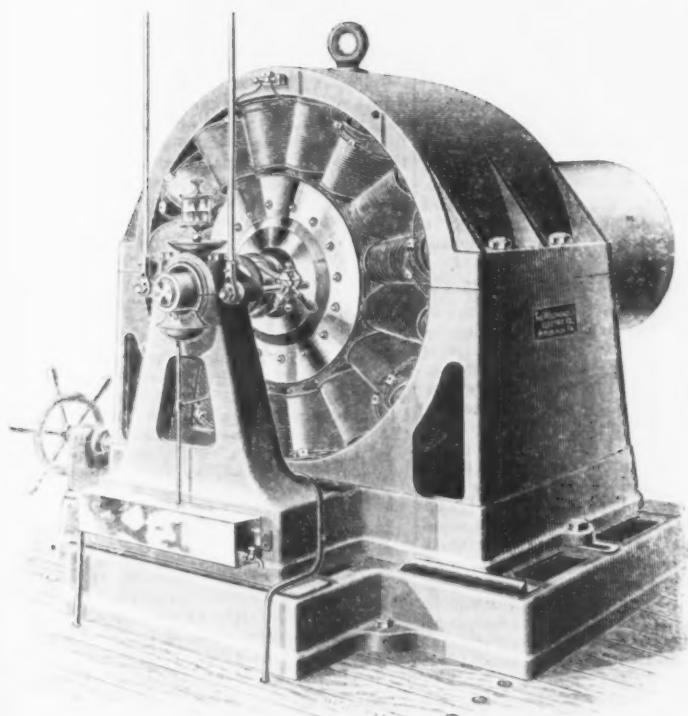
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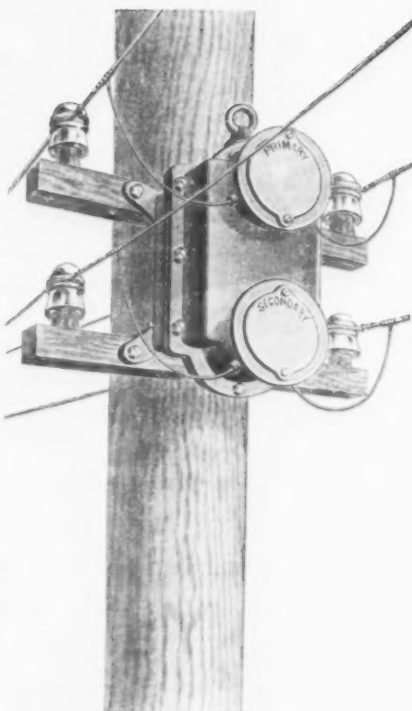
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ALEXANDER TRAUD,
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THE WEEK.

A. B. Miller, the extensive warehouseman who opposed the construction of the East River bridge, and has been prominent in the debates of the New York Chamber of Commerce and Board of Trade and Transportation, died in this city on Monday, aged 64 years.

The iron and steel bridges on the Pennsylvania Railroad built several years ago prove to be too flimsy for the 60-ton freight haulers recently put on—118,000-pound engines—and new structures of stone or heavy steel are replacing all others so far as practicable.

The Chinese Government possess the fastest torpedo boat in the world, just completed for them by Yarrow & Co., of England. Her builders claim that she has attained the extraordinary speed of 24 knots an hour.

There is reason to believe that the recent story about the loss of the sealing steamer Eagle, with 200 lives, was a canard from the notorious bogus news factory which not long ago declared that Newfoundland was being depopulated by the ravages of polar bears.

About 500 stove molders employed by Tribben & Sexton, Collins & Burgie, and the Chicago Stove Works, in Chicago, have refused to work on patterns from Bridge, Beach & Co., of St. Louis, boycotted for refusing to reinstate strikers. A lock-out will be the result. It is said the refusal to work on the patterns is general throughout Illinois, all the stove molders in the State, except at Peoria and Bloomington, being on strike.

Minister Hubbard transmits to the Department of State from Japan an extract from the Japan Gazette, Yokohama, commenting upon the rapidity with which the Japanese trade with the United States is increasing, and urging Japan to ask that nation to abolish the import duty on Japanese silk manufactures, and to promise, if that be done, American kerosene will be admitted into Japan free of duty. It argues that the United States is making a mistake in levying protective duties on Japanese goods.

Shippers having goods consigned from Eastern ports—mainly New York, Baltimore and Philadelphia, via the Pan Handle route, have met with serious losses for several years past. As the seals on the cars appeared undisturbed, it was generally believed that the depredations were performed at some one of the points consigning the freight. Detectives, however, were put to work, and the result is to discover that train employees have banded together in a combination whereby they have opened cars, removed what freight they could make available, and again sealed the cars in such a manner as to escape detection. It is estimated that fully \$500,000 worth of goods have been appropriated by train hands, and that not less than 350 men are implicated in the scheme. Those concerned in the robberies are being arrested, and developments of a decidedly sensational character are expected at no distant date.

The failure of a co-operative store in Newark, N. J., caused much consternation among workmen in various shops who were concerned in the enterprise when they learned that their wages had been garnished by the creditors.

Proposals have been asked for the construction of the bridge over the Arthur Kill, by which the Baltimore and Ohio Railroad can reach Staten Island, and the contract will be awarded on the 23d inst. The proposals will be received by the Staten Island Rapid Transit Company at its office in New York. Vice President King, of the Baltimore and Ohio Road, says that as soon as the contract is given out the work will be pushed as rapidly as possible, all the supposed legal impediments to the construction of the bridge having been disposed of.

President Cleveland has appointed as the commission to investigate the affairs of the Pacific railways, under the act of the late Congress, Ex-Governor Pattison, of Pennsylvania; E. Ellery Anderson, of New York, and David L. Littler, of Illinois. Mr. Anderson, a well-known lawyer of this city, in remarking upon the work which the commission have to do, says: "We have before us a complete examination of the financial relations of the United States with all railroads aided with bonds by the country. We will have to go over the whole financial history of these roads, past and present. It will be a great task, but we expect to have it finished by December, as the law on the subject provides. One of the principal questions, if not the main one, to be passed upon will be the distribution of earnings between the main lines and the branches. The roads whose affairs will come before the board include the Central Pacific and the Union Pacific and some 15 smaller lines, many of which have been amalgamated or merged into other systems. The whole subject of the absorption of the Kansas Pacific into the Union Pacific will have to be investigated. Somebody made \$10,000,000 or \$12,000,000 on that, for the stock went up from almost nothing to a high figure after the deal, and there has always been a great desire on the part of the public to know how it happened. The bill establishing the commission was intended to give the people a fair and just explanation of the

Governmental aid to the roads, how it was given, how the roads managed it, how their property has been handled and what security the Government now has for its loans, which amount to about \$100,000,000."

Peter F. Murray, a boss painter, and his assistant, Daniel Alford, both employed by J. B. & J. M. Cornell, the Centre street iron manufacturers, went to work one day last week in the unfinished Aldrich Building, at 41, 43 and 45 Broadway. They made what they believed to be a firm scaffold in the seventh story over the stair well. While shifting their positions a plank turned, and the scaffolding collapsed so suddenly that neither could save himself. Both struck the concrete floor, and death was instantaneous.

"The revised tariff which," says the Mexican Financier, "the Government has wisely adopted for use during the coming fiscal year is a concession to the mercantile community, and, taken in connection with the recent constitutional amendment prohibiting inter State transit duties, it should soon make itself felt in giving an impetus both to the import and the export trade. Those States which have given but a cold welcome to the constitutional change, and have construed its provisions liberally, are standing in the way of the prosperity of the whole country, and should in some way be made to comply with the highest law of the land."

Speaking of the military defenses of Canada, the Montreal Herald agrees with sensible men on both sides of our northern boundary when it says: "The best security Canada can have against future trouble from any quarter will be found in reciprocal trade with the United States." Bluster and bombast on either side yield no profit.

The Kansas City Times says: "It is announced that Swift & Co., of Chicago, the largest dressed-meat company in the world, will establish a mammoth beef-packing house in Kansas City. The land has been purchased, and work will be commenced at once. The Eastern packers have long been considering the advisability of moving further West. The labor troubles in Chicago and the passage of the Interstate Commerce law have caused the change."

The Building Committee of the Boston Chamber of Commerce have decided to erect an elegant structure, to cost \$1,000,000, including \$350,000 for the site.

Immigration at the port of New York this year is heavy, showing a marked increase since January 1 compared with any three months since the first quarter of 1882, when 68,685 were landed at Castle Garden, against 50,730 from January 1 to March 31, this year. The new arrivals include many Italians who are understood to have verbal contracts for labor on railways.

Americans are well received in London, and the British metropolis is becoming more popular with this class of travelers. A London letter says: "It has been discovered by the practical business men of London that there are a great many very rich people in America, and that they spend their money freely."

The ceremonies attending the accession to the throne, Feb. 7, of Kwang Su, the new Emperor, are described in the latest advices from the Chinese capital. A Shanghai correspondent says: "It is the opinion of well-informed people here that the rule of the present Emperor will be marked by important changes for the benefit of his vast dominions, and that ere many years we will not look upon China as the dark land as to Western civilization that she is now. The adoption of Western ideas is marching with telling strides, and Peking is at this moment agitated with many schemes for the laying of great railways and the sanctioning of internal steamboat communication. Promoters from the New and the Old World are busy on the capital, and have gained the ear of the foremost men. Any day we expect to hear that the imperial approval has been obtained to more than one proposal of vast importance, not alone to China but to the world, and more particularly the great industrial world. Two or three of the leading ministers are strongly in favor of progress according to Western notions, and their influence at headquarters may at any time now be felt."

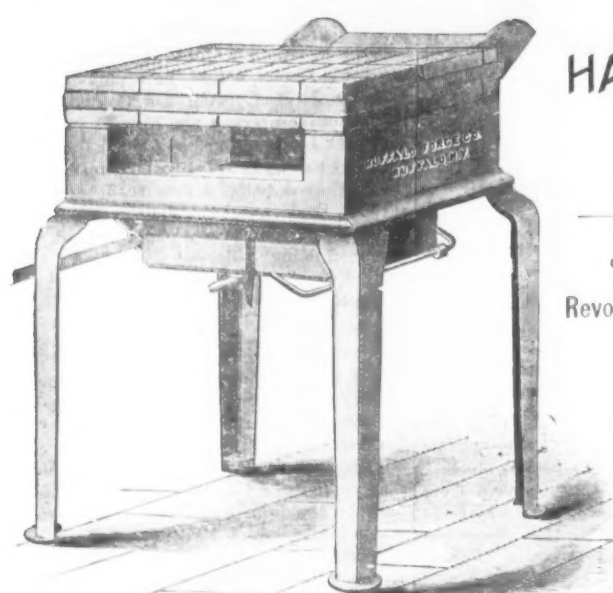
A Pittsburgh natural gas company have increased its capital \$1,000,000, nearly all of which will be expended the coming summer in extending its lines and digging wells. One line will be 17 miles in length, from Murrayville to Lawrenceville, supplying iron mills along the route.

The President appointed Benton J. Hall, of Iowa, to be Commissioner of Patents, vice M. V. Montgomery, resigned. Mr. Hall was born in Ohio, but went to Iowa after leaving college and became a lawyer. He served in both Houses of the Iowa Legislature, and was a member of the last Congress. He is 52 years of age.

The wooden roof of Horticultural Hall in Philadelphia covers a structure which cost \$800,000, built of stone, brick and iron, but it is so much decayed as to be dangerous, and the proposition now is to replace it with an arched covering of iron and glass.

The American steamship line to Venezuela and the United States of Columbia is one of the few enterprises of this character in the United States which have prospered from the start. The owners are Reulton, Bliss & Ballest, best known as coffee im-

BUFFALO HEATING FORGES



FOR
HARD COAL
OR
COKE.

COMPLETE WITH
Revolving Shaker Grates
AND
Blast Gate.

MADE IN
Ten Sizes
AND
Styles
FOR ALL CLASSES OF WORK.

BUFFALO FORGE COMPANY,
BUFFALO, N. Y.

NEW. GOOD. CHEAP.
METALOID Bushed, Self-Lubricating **HAY FORK PULLEYS,**
INSIDE IRON STRAP AND SWIVEL HOOK.



DESCRIPTION AND PRICE:

Style	Shell, 7 in.	Sheave, 4 1/2 x 1 1/2.	Hook, 3/8 in.	
H, Maple				
I, Ldg.				
K, Iron				
O, Maple				
		Pat. roller		
		Wood		

METALOID makes the best bushing for the money yet produced.

Penfield Block Co., Lockport, N. Y.

New York Agency, **HENRY B. NEWHALL CO., NEW YORK.**

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We have the largest and best facilities for furnishing the best quality of work and promptly.

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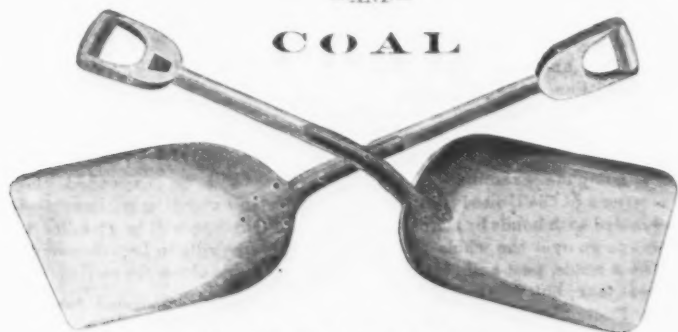
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MAKE A SPECIALTY OF

Railroad, Contractors' and Miners' Shovels,

—AND—

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Also call special attention to their

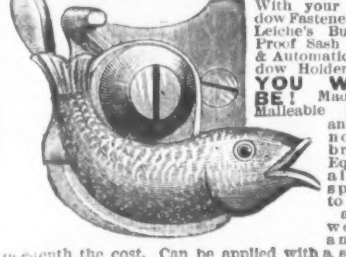
NEW PATTERN SMOOTH BACK COAL BARGE SCOOP.



Prices Quoted on Application.

J. C. McCARTY & CO., Direct Representatives,
97 Chambers St., New York.

YOU ARE NOT SATISFIED



With your Window Fastener. Try Leiche's Burglar-Proof Sash Lock & Automatic Window Holder and YOU WILL BE! Made of Malleable Iron and cannot be broken. Equally all respects to cords and weights and at one-tenth the cost. Can be applied with a screw driver by any handy person.

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Manufactured by

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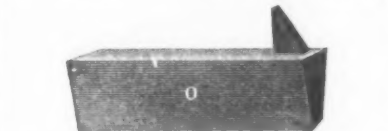
Successor to C. F. Dewick & Co.,

Manufacturer of

PATENT STEEL

Toe Calks,

360 Dorchester Avenue, Boston, Mass.



SOLID STEEL BLADES.



Adjustable HANDLES.

Pat. Sept. 8, 1885

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Middletown, N. Y.

VIRGINIA NAIL AND IRON WORKS COMPANY,

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NAILS and Bar Iron of Superior Finish, made exclusively from Pig Iron.

PATENTED ARTICLES OF
MALLEABLE IRON.
Hammer's M. I. Hanging Lamps.



HAMMER & CO.,
Pittsford, Conn.

For Sale by all the principal Hardware Dealers.

See for price list.

Malleable Iron Castings of superior quality and Hardware specialties in Malleable Iron made to order.



LATHES, BUFFERS, GRINDERS, CIRCULAR SAWS, FORGES

and other Brass and Metal Working Machines. Wood-Working Machines for Pattern use, &c. Illustrated Catalogue free. Don't send stamps.

P. PRYBIL,

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MACHINERY FOR Straightening & Cutting Wire
Of all Sizes to any Length.
Send for Catalogue.
J. N. ADT & SON,
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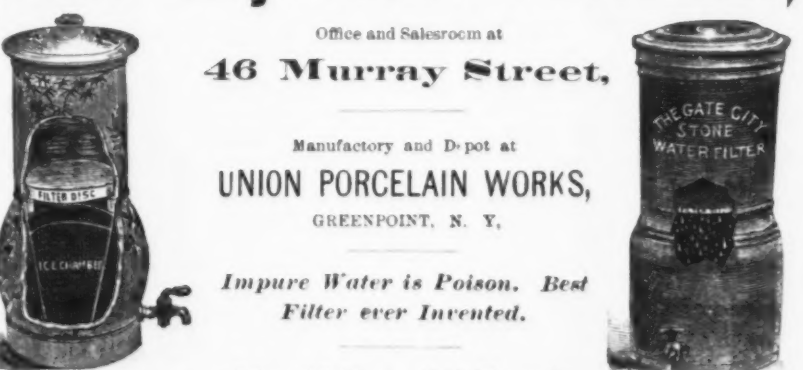
Manufacturers

Wood Engraving, Electrotyping, and Printing.

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Gate City Stone Filter Co.,



Office and Salesroom at
46 Murray Street,
Manufacture and Depot at
UNION PORCELAIN WORKS,
GREENPOINT, N. Y.

Impure Water is Poison. Best Filter ever Invented.

Price \$3.75 to \$41.25 each, according to size and style.

This open cut represents our China Filters with Filter Disc and

Patent Ice Chamber. By this arrangement the filtered water is cooled without mingling with the ice.

Cheap Stone Jar Filters for the kitchen. Fine Porcelain (with Ice Chambers) for dining-rooms, halls and offices. **Lasts a lifetime without change. NO METAL USED.** All common metals generate poison when in contact with water. **No Charcoal, Sand or other Compound used. They all absorb, retain and become foul with Living Organisms. Charcoal has no chemical effect on water. Our Filtering Medium is a Natural Stone.** No matter whether the impurities are organic or inorganic, they are left on the surface of the stone, which is as easily cleaned as an ordinary water pail or pitcher.

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Mixer, Measurer, Weigher, Scoop, Fruit, Starch and Wine Strainer, Rice Washer, Egg Beater, Also, Hunter's and Electric Light Sifters.
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TOWER & LAMONT, RAZOR STROPS, Rochester, N. Y.



The LAMONT is the original Combination Strop and the most useful. It positively has no equal. If your jobber does not have it, send to us. Best of Kissela leather.

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BOLTS AND NUTS, COACH OR LAG SCREWS

Bridge Bolts, Car Bolts, Track Bolts, Washers, Chain Links, BUILDING BOLTS AND IRONS OF ALL KINDS, Forgings, Bolt and Nut Machinery, &c.

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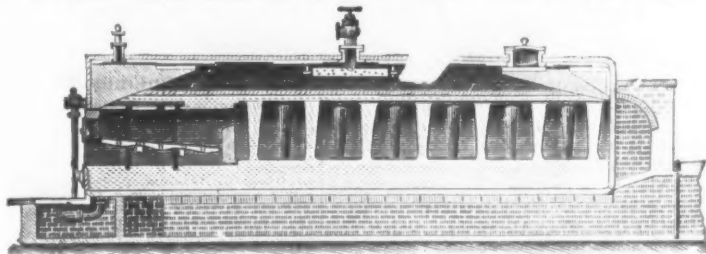
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CHURCH'S PATENT IMPROVED
DOUBLE SPEED INDICATOR
Either Right or Left.

MONTGOMERY & CO.,
Importers of Stubs' Files, Tools & Steel,
GROVER'S SWISS FILES, CHURCH'S PATENT FILES, &c.
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JEFFERSON IRON WORKS,
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MANUFACTURERS OF
JEFFERSON STEEL NAILS
WITH NATURAL GAS FUEL.

THE GALLOWAY BOILER.



Safety, Maximum Economy in Fuel, Lowest Cost of Maintenance,
Greatest Durability, Large Steam and Water Spaces,
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WM. F. SELLERS, Secretary. WILLIAM H. CONNELL, Treasurer.



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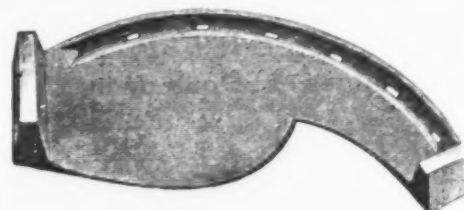
A great improvement over the old style. Prevents slipping from head of the nail. Made of best quality Tool Steel. Carefully tempered. Appreciated and bought at sight by all mechanics. Price on application. Made only by
The Edward Storm Spring Co., Limited, Poughkeepsie, N. Y.
JOHN A. GRAHAM & CO., 113 Chambers St., New York, General Agents.

EAGLE
MANUFACTURERS OF AND DEALERS
IN ALL KINDS OF
Foundry Facings
Plumbago or Black Lead.
Finest Return and Stove Plate Facing.
Used by all Stove Manufacturers who
pride themselves upon the Hand-
some Castings they make.

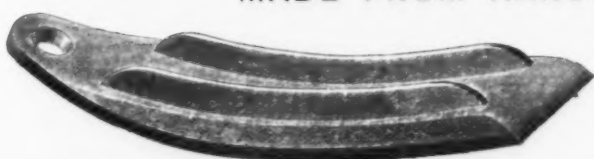
**THE LARGEST FACTORY MILLS IN THE
WORLD.**
Capacity 650 Barrels per Day.
Foundry Supplies.
Best One-Bag Return and
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ALSO SHIPPERS OF THE
Celebrated Cincinnati Molding Sand.
MONK'S MOLDERS' TOOLS.

Will put our "NATIONAL" and "EAGLE" RETURN
FACING against any similar Facing manufactured.
S. OBERMAYER FOUNDRY SUPPLY MFG. CO., CINCINNATI, OHIO.
ALSO MANUFACTURERS OF THE CELEBRATED
EAGLE PURIFIED FIRE-PROOF STOVE VARNISH.
For Quick Polish in Dry or Damp Weather, for Varnishing Polished Edges of Stoves and for the Preservation of Stoves and all Bright Metals
from Rust, it is superior to all others.

Mount Carmel Ox Shoes,
WITH STEEL TOE CALKS.
The Best and Cheapest Shoes Made.
Warranted to Outwear Any Other Shoe.
Six Sizes Each. Blunt and Sharp Calk.



WAGON SHOES
MADE FROM HARDEST CHARCOAL IRON.



No. 1, Length, 14 1/2 inches. Width, 6 inches.
For 2 1/4, 2 1/2, 2 3/4, 3 inch Tire.
No. 2, Length, 17 1/2 inches. Width, 6 inches.
For 2 1/4, 2 1/2, 2 3/4, 3, 3 1/2 inch Tire.

Send for Price Lists.
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PAYSON'S
STEEL
TRANSOM
LIFTER
Only one style lifter
in each size, which is
adapted to top, bottom,
or center hung transoms.
SEND FOR CATALOGUE AND
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**PAYSON MFG. CO.,
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Payson's Sash Locks,
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OSBORN MFG. CO.
79 TRADE MARK 79
BLEECKER ST. NEW YORK.

The Original Inventors and Manu-
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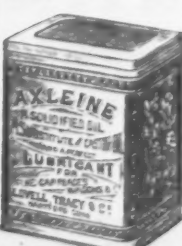
"OSBORN"

Bright Metal Cages, in Brass, Bronze and Silver Plate.

NEW AND BEAUTIFUL DESIGNS JUST OUT.

We also manufacture Brass and Bronze Snow Stands for Fancy Roads. Catalogues Mailed Free.

AXLEINE GUN POWDER



is a fine quality of Axle
Grease, put up in square
tin boxes containing
one pound, beautifully
decorated in assorted
colors, designed espe-
cially for the Hardware
Trade. Showy and at-
tractive for goods.
Send or sample and
prices.

LAFLIN & RAND POWDER CO.,
No. 29 Murray Street, New York.

Manufacture and sell the following celebrated brands
of Sporting Powder, known everywhere as
Orange Lightning, Orange Ducking,
Orange Rifle.
More popular than any Powder now in use.
BLASTING POWDER AND ELECTRICAL BLASTING
APPARATUS. MILITARY POWDER on
hand and made to order.
Safety Fuse, Frictional and Platinum Fuses.
Pamphlets showing sizes of strains sent free.

LOVELL TRACY & CO., 21 Asylum St., Hartford, Conn.

porters. They will soon add a new wooden
steamer, to be built by the New England
shipbuilding Company; engines and ma-
chinery by the Cramps.

The date fixed for the opening of the
American Exhibition in London is May 2.

Gen. C. J. Paine, owner of the yacht
Mayflower, has ordered a new steel sloop to
be built, for the purpose of defending the
America's cup against the Scotch cutter
Thistle. The designs are being prepared by
Edward Burgess, of Boston. She will be 86
feet in length, and be built of steel through-
out in frame and plating. The plating will
be from 1/2 to 3/4 inch in thickness. Con-
tracts for the work of construction have
already been signed by Messrs. Pusey &
Jones, of Wilmington, Del.

The Secretary of the Navy invites sealed
proposals from the shipbuilders of the United
States for building five new war vessels.
The first of these vessels, for the construc-
tion of which bids are solicited, is the New-
ark, a 4000-ton cruiser, authorized to be
built by the act of March 3, 1885. Propo-
sals were invited for this vessel last year,
but the lowest bid exceeded the limit of cost
(\$1,100,000) named in the act. At its last
session Congress increased this limit to
\$1,300,000.

Cholera appeared to be increasing in viru-
lence in the Argentine Republic and many
other parts of South America up to a recent
date. Captain Porter, of the bark General
Fairchild, from Buenos Ayres, says the daily
death rate at that port was 400. Seamen
were frequently attacked. Direct advices to
February 20 say the disease has wholly
ceased.

A sugar refining company in San Fran-
cisco who have a three years' contract for
about 75 per cent. of the Hawaiian sugar
product, will send a cargo of 2500 tons
direct to New York, and under the Inter-
state Commerce law a large proportion of
the crop is likely in the future to come
round the Horn. Last year over 100,000-
000 pounds were sent by the overland
route.

For about two years a training school has
been maintained by the Baltimore and Ohio
Railroad Company making liberal appro-
priations from their treasury. At a suburb
known as Mt. Case the company have
shops employing 4000 workmen and 150
apprentices, and have shown such good
results in fitting the apprentices for respon-
sible positions in the drafting and other
departments that the directors of the com-
pany have voted \$25,000 for the develop-
ment and support of the school this year,
and \$20,000 annually hereafter as an endow-
ment. The school is to give a liberal edu-
cation in mechanics, engineering, drawing,
chemistry and applied sciences to the ap-
prentices employed by the company. The
company act upon the theory that the wel-
fare of the corporation depends no less
upon the prosperity and contentment of
their employees than the latter's ability to
earn a livelihood depends upon the finan-
cial strength and prosperity of the corpora-
tion.

The Commissioner of Labor Statistics of
Illinois reports that of the 114,365 men en-
rolled as members of the various labor
organizations of that State fewer than one-
third are native Americans. It would be
interesting to know whether the discrepancy
here noticed arises from a distaste for in-
dustrial pursuits on the part of native born
citizens or to a determination to preserve
their personal liberty.

The iron and iron ore importing firm of
Latassa & Co., mostly in the Spanish trade,
suspended payment last week with near
\$150,000 liabilities and little or no assets.
The firm held contracts for the delivery of
large quantities of ore and represent that
the recent advance in ore freights swamped
them.

The alleged demand of Great Britain for
the possession of Tortugas Islands for the
payment by the Haytian Government of
\$1,000,000 in settlement of old claims is re-
ceiving the attention of the State Depart-
ment at Washington. The United States
have great interests in Hayti, commercial
and otherwise, and are deeply concerned in
its welfare and prosperity. A correspond-
ence will be opened with Great Britain on
this subject.

Canadian customs officers have received
an order from the government directing
that in future travelers entering Canada by
rail shall prepare an inventory of the con-
tents of their baggage, describing in detail
the contents of each trunk, valise or pack-
age. This must be presented to the Cana-
dian customs officials on the train, and
failing this formality such baggage shall be
sent to the Custom House to be examined
after the arrival of the train at its destina-
tion. The order applies to everybody—im-
migrants, tourists, Canadians returning to
Canada, and all who propose to place foot
on the soil of the dominion. Rather than
submit to regulations so offensive it will not
be strange if citizens of the United States
the coming season prefer to remain on this
side of the boundary line.

Wooden shipbuilding in Canada, like that
in the United States, suffers from the com-
petition of iron and steel. The trade and
navigation returns of the Dominion for
1886, which will shortly be laid before Par-
liament, show that last year the aggregate
tonnage of vessels built in Canada was only

37,531 tons, against 57,456 tons in 1885,
70,287 tons in 1884 and 188,098 tons 10
years ago. The decline is apparent in
every province. The tonnage registered
in Canada and added to the Dominion mer-
chant fleet in 1886 was 49,872, as compared
with 65,962 tons in 1885, 59,822 tons in
1884 and 204,002 tons 10 years ago. While
the returns of shipping built show a marked
decline, the tonnage of vessels entered in-
ward and outward at Canadian ports has
but slightly fallen off, thus indicating that
the carrying trade of the Dominion is passing
into the hands of British and foreign vessels.

The Master Builders' Exchange was
opened in Philadelphia last week, with the
object of establishing and maintaining uni-
formity in commercial usages, adjusting
controversies, &c.

The accepted plan for the national li-
brary building at Washington would make
the cost of the structure \$3,000,000. It will
cover upward of two acres.

The application of the New York Under-
ground Railway for permission to open La-
fayette Place and commence the work of
construction is still awaiting the decision of
Corporation Counsel LeCombe. The line
begins at City Hall Park and runs thence
nearly direct by way of Lafayette Place
and through Fourth avenue to Union Square.
There the line divides, one route running
up Fourth avenue to the Grand Central
Depot, and another by Broadway to Madison
Square. Again dividing, one line flows
up Broadway to the Eighth avenue entrance
to Central Park, and another along Madison
avenue to the Harlem River. The plan
contemplates a four track road, two for
express trains and two for way trains. The
Rhode Island Locomotive Works, at Provi-
dence have already been ordered to proceed
with the construction of electrical engines to
be used on the line. They will be power-
ful motors, each weighing 48,000 pounds, of
400 horse-power, and capable of making 50
miles an hour. There will be three sets of
drivers, 60 inches in diameter, with arma-
tures 36 inches in diameter and an electrical
capacity of 500,000 Watts. They will be
equipped with automatic electro magnetic
brakes, capable of stopping a train instantly
and with interlocking levers. The same
power that propels the locomotives will work
the signals, light every part of the structure,
including the cars, with incandescent light,
and likewise run the exhaust fans at the
several stations. All trains will be composed
of 10 cars, each containing 50 seats, making
the total seating of 500 passengers per train,
as no person will be allowed to stand. The
capacity of the road will be equal to a million
passengers a day.

The Secretary of the Navy has approved
the modified plans for the change of the
Washington Navy Yard into an ordnance
foundry. The modifications contemplate
the retention of the existing buildings for
the manufacture of six and eight inch steel
guns and other minor work. The changes
will be made immediately.

A company has just been formed under
the name of the Kingston and Pembroke
Iron Mining Company, for the purpose of
developing the iron ore district on the line
of the Kingston and Pembroke Railroad.
The capital stock is \$5,000,000, and has all
been subscribed. The president is Henry
Siebert, of this city.

The Government of the Argentine Repub-
lic, in accordance with an act of Congress
to establish bureaus of information in Paris,
London, Berlin, Vienna, New York, Bos-
sels and Baie, have appointed Mr. J. A. Kine
director of the bureau in this city. It will
be opened at No. 160 Fulton street about
the 1st of May, and will supply, without fee,
any information required concerning tariffs,
products, prices current, or other matter
relating to the condition and progress of the
country.

A movement is now going on to establish
at Curtis Bay, Md., an extensive steel pipe
works, and a party is there from New York
who asks of Baltimore only one-half of the
cost of the plant. It is proposed to make steel
guns of heavy caliber without boring. Mr.
Robert Garrett is interested in the enterprise,
and has offered to take \$25,000 of the stock.

The New York Dock Department have
acquired the title to all the bulkhead on the
North River front from Vestry street to
Warren street, excepting a single pier, in
accordance with a plan to secure for the city
the ownership of the entire bulkhead line.

The New York Chamber of Commerce
express disapprobation of all schemes for the
construction of bridges across the Hudson
River between the cities of Albany and New
York upon any plan which involves the
building of piers in any part of the river,
so as to obstruct in any degree the flow of
the tides.

Naval officers are much pleased with the
result of an attempt made at Thurlow, Pa.,
to cast a steel stem for the new cruiser Bal-
timore, now building at Cramp's shipyard,
Philadelphia. The piece weighed 17,000
pounds, and was cast without a defect.
Commander Evans has just examined and
tested the casting and pronounced it to be
excellent.

Ice three feet thick in the Erie Canal will
make a late opening. Hudson River navi-
gation was resumed on the 7th inst.

Mayor Hewitt says an elevated railroad in
Broadway may become necessary, but its
erection will be "an act of vandalism."

Special Notices.

WANTED.—An experienced and pushing man desires position as Mill Foreman or Roll Turner, age 38, Above 90 years with mills manufacturing every variety Steel and Iron. Overseas and has general knowledge of all work embraced in mill trades. Address "EXPERIENCE," Box 44, Office of The Iron Age, 66 and 68 Duane St., New York

Special Notices. BARGAINS.

45 x 6 Vertical Engines, New	\$15
10 x 6 " "	85
10 x 8 " "	140
10 x 10 " "	155
10 x 12 " "	165
10 x 14 " "	210
10 x 16 " "	240
10 x 18 " "	280
10 x 20 " "	320
10 x 22 " "	360
10 x 24 " "	400
10 x 26 " "	440
10 x 28 " "	480
10 x 30 " "	520
10 x 32 " "	560
10 x 34 " "	600
10 x 36 " "	640
10 x 38 " "	680
10 x 40 " "	720
10 x 42 " "	760
10 x 44 " "	800
10 x 46 " "	840
10 x 48 " "	880
10 x 50 " "	920
10 x 52 " "	960
10 x 54 " "	1000
10 x 56 " "	1040
10 x 58 " "	1080
10 x 60 " "	1120
10 x 62 " "	1160
10 x 64 " "	1200
10 x 66 " "	1240
10 x 68 " "	1280
10 x 70 " "	1320
10 x 72 " "	1360
10 x 74 " "	1400
10 x 76 " "	1440
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10 x 80 " "	1520
10 x 82 " "	1560
10 x 84 " "	1600
10 x 86 " "	1640
10 x 88 " "	1680
10 x 90 " "	1720
10 x 92 " "	1760
10 x 94 " "	1800
10 x 96 " "	1840
10 x 98 " "	1880
10 x 100 " "	1920
10 x 102 " "	1960
10 x 104 " "	2000
10 x 106 " "	2040
10 x 108 " "	2080
10 x 110 " "	2120
10 x 112 " "	2160
10 x 114 " "	2200
10 x 116 " "	2240
10 x 118 " "	2280
10 x 120 " "	2320
10 x 122 " "	2360
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10 x 130 " "	2520
10 x 132 " "	2560
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10 x 136 " "	2640
10 x 138 " "	2680
10 x 140 " "	2720
10 x 142 " "	2760
10 x 144 " "	2800
10 x 146 " "	2840
10 x 148 " "	2880
10 x 150 " "	2920
10 x 152 " "	2960
10 x 154 " "	3000
10 x 156 " "	3040
10 x 158 " "	3080
10 x 160 " "	3120
10 x 162 " "	3160
10 x 164 " "	3200
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The Iron Age

AND METALLURGICAL REVIEW

New York, Thursday, April 14, 1887.

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Freight Differentials.

Aside from the great effects of the Interstate Commerce law, which we all realize, such as the restriction of the long and short haul section, it is probable that one of the subtle, but yet important, results will be a certain shifting of trade, and one of the factors toward future changes has not received that consideration to which it is entitled. We allude to a possible growth of a system of differentials as between competing railroads. In passenger business this principle has been already recognized. Between New York and Chicago, for example, the roads, which, by reason of poor accommodations or slow time, could not compete with their better-equipped rivals, have been allowed by agreement to charge for their tickets so much less than the first-class road as would compensate for their disadvantages and secure for them a reasonable share of the passenger travel. This deduction from the standard charge is called a differential. This principle has not been heretofore applied very extensively in matters of freight, because unnecessary under the pooling system. Under the old plan of pooling, two or more roads which competed for the traffic of any important trade center or section would decide what proportion of the entire traffic should be allotted to each competing rail way. In the case of the weaker roads, their percentage of the united earnings was not based upon the actual amount of traffic which they could legitimately control, but often was in proportion to their capacity for breaking up the pool. The attitude of many an inferior railroad was this: "Give me 20 per cent. of the pool earnings or I will prevent you all from earning anything," and perhaps a compromise of 15 per cent. might be agreed upon when the actual share which this line could honestly command might not equal to half that percentage. Thus with all its advantages the pooling system had this bad feature, that the amount of traffic and of revenue did not always depend upon corresponding advantages to the traveling and freighting public. Competition is, after all, our main dependence for further improvements in transportation as in all other business.

Under the new Interstate Commerce law pooling is absolutely prohibited, and each road, strong or weak, is left to make such rates as it sees fit. The railways comprising the old pools have met and agreed upon rates hereafter to be charged, but the old pool agreement guaranteeing a fixed revenue to the weak roads is abolished. At first unquestionably the rates will be observed by all the roads, but it is inevitable that the strong lines with their quick dispatch, full equipment, and expensive terminals will slowly absorb much the greater part of the traffic. What then shall the other and roundabout lines do? If they maintain rates they will certainly lose their business. An illustration of this is the recent demand of the Grand Trunk for a differential rate between Chicago and New York via the roundabout Montreal route. It is inevitable that the merchandise from Chicago to Boston will take the short and quick line across the country if rates are maintained. Under the old arrangement it was not a matter of so much importance, because a certain share was granted the Grand Trunk in any event, but now that railroad asks permission to charge so much less than the agreed standard rate as will enable it to carry its old amount of traffic.

The difficulties of the question are very great. If the Grand Trunk is entitled to this concession, why not every road between the points named? And if between Chicago and Boston, why not between Pittsburgh and New York? It will be seen that if every city and every line should have agreed advantages, the uniformity of the whole system would be destroyed and business entirely disarranged throughout the country. The question comes up, too, upon what basis and for what reasons such deductions from the schedule should be allowed. Should they be proportioned to slow service? This would simply be putting a premium upon poor railroading. Upon lack of terminals? Let the badly equipped road build them. Upon what, then, should differentials be calculated? Here an important fact should be noted. The new law forbids a greater aggregate charge for a shorter than for a longer distance. The roundabout roads cannot cut rates from any trade center without reducing their local rates to the same standard. This adds to the difficulty, and in one sense to the safety of the problem, since disastrous rate wars as the result of differences are no longer probable. Still the fact remains that the Grand Trunk has asked for a modification of the rates in its behalf, and that many of the railroads are practically out of the business at important points like Pittsburgh. Will they quietly allow their old traffic to slip away from them? Can they in justice to themselves allow it? No, nor is it for the interest of the business world that fair competition should be abolished. Some way out of these difficulties, forced upon the railroads by the new law, must be found. In spite of its perplexities, some modified application of the differential theory would seem to be best, but he would be a rash prophet who would now venture to predict what form it will finally assume, and what the results will be upon the currents of trade.

Condition of the Blast Furnaces of the United States, April 1, 1887.

The capacity of the furnaces at work on the 1st of April showed a slight decline, so far as the anthracite stocks are concerned, but exhibit a further increase in the weekly make of the plants running with coke or raw coal as a fuel. From present indications there will be a further accession to the supply during the current month, but will be chiefly in the direction of an increased make of Bessemer grade, which is the strongest on the list, so far as prices are concerned, and notably so in the West. The status of the anthracite furnaces was as follows on the first of the month:

Anthracite Furnaces in Blast April 1.

Location of furnaces.	Total number of stacks.	Number reported in blast.	Capacity per week.	Number reported out of blast.	Capacity per week.
New York.....	15	17	4,987	12	3,398
New Jersey.....	15	9	3,708	6	2,145
Pennsylvania.....	8	3	268	0	0
Lehigh Valley.....	48	33	12,737	9	2,280
Schuylkill Valley.....	1	1	141	0	0
Susquehanna Val.....	41	29	8,975	15	2,491
L. Susquehanna Val.....	18	13	3,527	5	615
Susquehanna.....	35	20	8,634	9	2,474
Spiegel.....	1	1	347	0	0
Maryland.....	4	1	250	3	335
Total.....	198	139	43,285	39	16,897

As compared with former months these figures stand:

	Furnaces in blast.	Capacity per week.
April 1, 1887.....	139	43,285
March 1, 1887.....	132	43,724
February 1, 1887.....	137	41,951
January 1, 1887.....	130	40,793
December 1, 1886.....	119	36,820
November 1, 1886.....	116	36,348
October 1, 1886.....	114	35,819
September 1, 1886.....	112	33,297
August 1, 1886.....	120	36,841
July 1, 1886.....	121	36,702
June 1, 1886.....	121	38,251
May 1, 1886.....	119	39,924

In New York there have been no changes of any note, although the Port Henry and Kirkland furnaces recently blown in have not yet come up to full product. On the first of the month the torch was applied to the first of the three Troy furnaces, which will considerably increase the make of the

State, the other two probably following in due course. The Peckskill is also expected to go in soon. In New Jersey, the number of stacks running remain the same. The aggregate product, however, appears to be steadily gaining, the capacity of a number of the plants being notably increased as compared with former years. In the Lehigh Valley, one of the Thomas furnaces has gone out, as also one of those of the Allentown Iron Works. On the other hand, the third small furnace at Carbon is to be put in at an early date. In the Schuylkill Valley the second Brooke furnace went in on the 26th ult., and there have been some other additions to the list of producers. Nothing noteworthy has happened in the Upper Susquehanna district. In the Lower Susquehanna group, the Pennsylvania Steel Company had only two furnaces running on Bessemer pig on the 1st inst. No. 2 St. Charles went in on the 20th ult., while Cordelia is expected to blow in soon on Bessemer pig. In Maryland one of the Catoctin furnaces has blown in. On the whole, indications point to a further slight increase in the output of anthracite pig, though apparently chiefly in Bessemer grade.

The following is the status of the coke furnaces:

Bituminous or Coke Furnaces in Blast

April 1, 1887.

Location of furnaces.	Total number of stacks.	Number reported in blast.	Capacity per week.	Number reported out of blast.	Capacity per week.
Pennsylvania.....	17	16	15,000	1	550
Pittsburgh.....	1	1	450	0	0
Allegheny Valley.....	2	1	470	1	115
Shenango Valley.....	30	15	8,807	5	1,205
Youghiogheny.....	6	4	1,399	2	560
Junata & Conemaugh.....	22	15	6,580	2	2,343
Spiegel.....	2	1	235	1	0
Maryland.....	10	3	120	1	90
West Virginia.....	6	4	1,846	2	597
Ohio.....	15	11	7,854	4	1,996
Mahoning Valley.....	15	8	1,811	7	747
Hocking Valley.....	13	11	2,464	2	394
Miscellaneous.....	17	13	7,131	4	2,134
Kentucky.....	3	3	925	0	0
Tennessee.....	2	2	3,448	1	0
Georgia.....	12	2	786	0	0
Alabama.....	12	2	3,722	4	1,340
Indiana.....	6	2	333	0	0
Illinois.....	16	10	10,521	6	4,750
Michigan.....	140	140	73,013	0	0
Missouri.....	3	2	2,015	4	1,565
Wisconsin.....	3	2	1,409	1	975
Colorado.....	1	1	600	0	0
Total.....	206	148	81,796	67	20,776

As compared with former months the record is:

	Furnaces in blast.	Capacity per week.
April 1, 1887.....	148	81,796
March 1, 1887.....	146	79,682
February 1, 1887.....	145	79,357
January 1, 1887.....	137	73,422
December 1, 1886.....	139	73,795
November 1, 1886.....	140	73,013
October 1, 1886.....	136	70,862
September 1, 1886.....	133	69,306
August 1, 1886.....	134	68,852
July 1, 1886.....	132	71,316
June 1, 1886.....	129	70,766
May 1, 1886.....	129	67,888

In the Pittsburgh district, Furnace C. of Carnegie Bros. & Co., has been blown in, making six furnaces in operation. Furnace D of this concern has produced 160,000 tons of iron in one lining, which is certainly a remarkable record. Clinton Furnace, of Graff, Bennett & Co., was also blown in last month, after being thoroughly repaired by Lean & Blair, engineers, of Pittsburgh.

In the Shenango Valley the same furnaces are producing, the majority of them having made a good quantity in March. Nothing worthy of note has occurred in the other Pennsylvania coke districts. In the Mahoning Valley, Ohio, both the Himrod furnaces are now out, and the Anna, at Struthers, too, has stopped to have a new lining put in. This stack was last repaired over five years ago, and has made over 100,000 tons of metal. It had stood two and one-half years when the present company took the stack. It will probably resume operations by the middle of May. The Girard furnace has made an exceptionally good record during March, making more than it ever had produced in one month. For the 31 days it turned out an average daily of not less than 152 tons. Among the coke furnaces of Central and Northern Ohio it should be noted that the Steubenville and Zanesville furnaces are out for repairs and that the Cleveland Rolling Mill Company is running three out of its four stacks. In the Hocking Valley and the Hanging Rock region there have been no important changes.

Turning Southward we may note that the Virginia stacks are doing very well; that the Kentucky coke furnaces are all running, while in West Virginia the product is relatively small, because Belmont is undergoing remodeling. Further South the March product has not been very heavy, some of the furnaces in Alabama being short of coke. Both of the Woodward furnaces were out on the 1st inst., but one of them has since gone in. In Tennessee the starting of the second Dayton furnace will make the entire number of coke plants in that State active.

In the West, beginning with Illinois, the output has been large. No. 7 South Chicago went out on the 10th, and on the same day No. 6 blew in. Calumet, North Chicago, Joliet and Union are all making full product. In Wisconsin Minerva is expected to go in in a few days, and in Michigan Grace Furnace is being prepared for work. In Missouri the same furnaces are running. Jupiter, which is undergoing repairs and is receiving Gordon-Whitwell-Cowper stocks, will not be ready until the 15th of June.

The condition of the furnaces using charcoal as a fuel was as follows on the first of the month:

Charcoal Furnaces in Blast April 1, 1887.

Location of furnaces.	Total number of stacks.	Number reported in blast.	Capacity per week.	Number reported out of blast.	Capacity per week.
New England.....	14	7	556	7	496
New York.....	10	5	724	5	495
Pennsylvania.....	23	4	324	19	596
Virginia.....	13	2	300	11	1,298
North Carolina.....	23	0	0	23	1,398
West Virginia.....	2	1	92	1	90
Ohio.....	3	0	0	3	163
Michigan.....	17	4	399	13	508
Tennessee.....	3	0	0	3	405
Georgia.....	9	4	727	5	226
Alabama.....	2	0	0	2	145
Florida.....	11	7	1,565	4	465
Wisconsin.....	65	9	2,473	19	3,359
Minnesota.....	9	2	550	7	750
Missouri.....	1	1	430	0	0
Illinois.....	4	2	639	2	510
Texas.....	2	0	0	2	330
California.....	1	0	0	1	245
Washington Territory.....	1	1	175	0	0
Oregon.....	1	0	0	1	100
Total, April 1.....	174	49	8,967	123	11,928

Among the charcoal furnaces in New England it is to be noted that two Richmond furnaces blew in March, while the Kent went out. In Pennsylvania Isabella has probably resumed at this writing. In Michigan the Eureka furnaces are now both idle, and Union, too, has blown out. Martel may possibly resume during the month, and Iron River is expected to begin work on the 1st of May. Minneapolis furnace has been doing good work lately. It made 58 tons on the 24th ult., 57 tons on the 25th and 56 tons on the 26th with one blind tuyere. In Alabama Ironaton furnace went out after a 14 months' campaign, a new hearth to be put in before resuming. Jenifer, Rock Run, Shelby, Woodstock a J. de Tecumeh are doing good work.

We estimate the actual product of the anthracite furnaces as follows for the first quarter:

Estimated Production of Anthracite Pig, Three Months.

	Gross tons.
New York.....	51,18
New Jersey.....	4,353
Schuylkill Valley.....	106,629
Lehigh Valley.....	156,473
Upper Susquehanna.....	44,647
Lower Susquehanna.....	134,126
Maryland.....	4,565
Total.....	533,942

From very full returns of actual monthly output, we estimate the make of coke pig in the different districts of the country as follows:

Estimated Production of Coke Pig First Three Months.

	Gross tons.
Pittsburgh district.....	181,213
Shenango Valley.....	104,608
Allegheny and Youghiogheny valleys.....	21,619
Junata and Conemaugh.....	80,973
Maryland.....	1,000
Virginia.....	84,801
West Virginia.....	22,888
Mahoning Valley.....	35,439
Central and Northern Ohio.....	17,698
Hocking Valley.....	29,362
Kentucky.....	10,640
Tennessee.....	44,856
Georgia.....	10,283
Alabama.....	50,114
Indiana.....	3,910
Illinois.....	130,837
Missouri.....	21,332
Colorado.....	6,500
Total.....	980,240

The make of the leading charcoal iron-producing districts was as follows:

Estimated Production of Charcoal Pig First Three Months.

	Gross tons.
New England.....	13,381
New York.....	18,719
Pennsylvania.....	58,719
Virginia.....	23,039
Michigan.....	2,401
Wisconsin and Minnesota.....	9,448
Hanging Rock.....	50,851

How enormous our current output is may be gathered from the following comparison of the record of the past quarter, with the make of the first and second half of 1886, as under:

	First half 1886.	Second half 1886.	First quarter 1887.
Anthracite.....	908,334	971,795	533,942
Coke.....	1,558,536	1,571,833	980,240
Total.....	2,466,870	2,543,628	1,514,182

Unless something serious interferes with furnace work, the output of the second quarter of 1887 will be larger than that of the first, so that the make for the first half year will be in the neighborhood of 3,100,000 gross tons. A number of furnaces having only recently started in after remodeling, others now undergoing such changes, and about half a dozen great, new stacks being likely to come in as new producers.

From widely separated sections of the country come jubilant reports of a lively advance in real estate. The appreciation in values is so rapid in some sections and sales are so numerous that the movement has already locally assumed the proportions of a wild speculation. Attention is naturally attracted to those localities where the rise has been greatest and profits have been largest. Too many conservative men are apt to condemn the entire movement as dangerous in the extreme, because they justly condemn the excesses alluded to. No one will deny that they are right when they state that crazy speculation in town lots and mineral property must in the long run bring grief to the locality so afflicted. They will not be contradicted when they assert that "booms" in real estate may benefit a few,

but do not in the long run much aid the community. While well founded objections may be made to anything that approaches an unhealthy development, it must not be forgotten that as a whole the moderate appreciation of real estate which is going on all over the country will legitimately and favorably affect business. While the eyes of all are riveted to the craze which is raging in a few localities, the manufacturer and trader who is watching the course of events should base his operations rather upon the quiet development which is going on all over the country. While it is less likely to cause comment, it is in reality far more likely to have its effect upon business generally. In the aggregate it represents a far more powerful, far more sustaining propelling force, whose effects will not be dissipated in a month or in a year. The quiet and general improvement in real estate values which is now going on is the natural and legitimate result of the slow, but, in the aggregate, great accumulation of wealth and increase in population during the last five years. As a nation, we have practiced economy for that time. Savings have accumulated which the holders now have courage enough to invest in new and better homes. The movement has naturally been gradual, almost imperceptible, but it may be relied upon to last longer and to tell strikingly upon many important lines of trades, among which the hardware and allied industries are likely to take an important share.

The Chicago Contest with Socialism.

The municipal election which took place in Chicago on the 5th inst. was of almost national importance. Through a peculiar combination of circumstances the contest for control of the affairs of the city was waged between two parties, although a triangular fight of a purely partisan character had been expected. The Labor party nominated candidates for all the city offices, headed by Robert L. Nelson for Mayor. The Republicans also nominated a full list of candidates, naming as their choice for mayor John A. Roche, manager of the Chicago branch of J. A. Fay & Co., of Cincinnati, manufacturers of machinery. The Democrats placed into the field a full ticket, but their candidates declined to stand, which greatly simplified the struggle. The labor ticket was originally the expression of honest workmen who believe their condition can be improved by political action, but as the campaign progressed it was found that the turbulent spirits who have in the past caused so much trouble in Chicago had laid their plans to control the affairs of the city in case the Nelson ticket was successful. All parties opposed to anarchy and socialism therefore rallied to the support of the Roche ticket, divesting it of its partisan character, and it was successful by an overwhelming majority. Such a contest should not have been a doubtful one from the beginning, but Chicago contains a larger proportion of labor agitators than any other American city, and it was feared that, by coercion and a resort to the ingenious expedients which have latterly been devised to control large masses of workmen, the support of Chicago wage-earners would be given solidly to the candidates ostensibly representing their interests. The large opposition vote recorded against Nelson shows that many workmen were not willing to recognize this mastery over them. Had he been successful, the business interests of Chicago would have received a shock that would have felt throughout the United States. Capitalists would not have waited to see what the result would be, but as far as they could do so they would have taken means to secure their property against total loss. All enterprise would have been stagnant for a time, and the marvelous progress of Chicago would have been seriously checked.

It is too much to assume that the city would have passed entirely into the control of the most radical of the anarchists or socialists, with destructive consequences. Means would have been undoubtedly taken to avert such a calamity. But while such measures were being formulated, perhaps by State authorities, business would have been almost paralyzed. The gravity of the situation compelled the most earnest consideration of the possible consequences. Now, however, that the contest is over it is probably well that it has taken place, since on the one hand the full strength of the destructionists has been demonstrated, and on the other hand the people have been thoroughly awakened to a discussion of the causes which underlie the strange movement against society now in progress in so many sections of the country.

Dr. Landsberg, the general manager of the Stolberg Company, sends us a copy of his annual report covering the status of the lead and zinc works of Germany during the year 1886. It appears that the rise in prices in the case of lead did not bring about a notable increase in the output. In fact, the most important lead-producing section, the Rhenish provinces and Westphalia, witnessed a falling off from 58,026 tons in 1885 to 55,076 tons in 1886. This, it is explained, was due chiefly to a scarcity of ore, and was the result of the long depression preceding the year 1886. It was the old experience that during bad times even the most careful and conscientious mine manag-

ers cannot resist the temptation to draw heavily on cheaply extracted ore reserves, and allow expensive dead work to fall behind. The usual result is that, after a protracted struggle against low prices, few concerns are able to quickly increase output to meet a widening market and take advantage of higher prices. While thus the leading German lead-producing district has fallen back, one concern in Silesia, the Tarnowitz, which is controlled by the German Government, have considerably increased their output, going up from 12,804 tons in 1885 to 15,061 tons in 1886, so that on the whole the make of Germany has declined only from 92,305 metric tons in 1885 to 91,990 tons in 1886. In the case of spelter, the make of Germany has remained practically stationary. Under the operation of the international pool all the zinc producers in Germany outside of Silesia agreed not to make more than they had produced in 1885, the section named being allowed to increase its make by 5 per cent., which apparently they have done.

The Difficulties Between England and Venezuela and Hayti.

On March 24 a cable dispatch was received from Venezuela stating that the Guiana frontier question was assuming an unfavorable phase, and would probably lead to difficulties between Great Britain and Venezuela, the report being confirmed that the British Minister at Caracas had received his passport. This suspension of diplomatic relations between England and the Republic of Venezuela has a serious import for the Colony of British Guiana. The dispute is an old one, but for 20 years has lain dormant. Put as briefly as possible, it is whether the river Essequibo divides the Colony of British Guiana and the Venezuelan Republic, or whether the British territory extends beyond the western bank of the river, and, if so, how far? The British Government claims that it does extend beyond the western bank over a considerable area of country into a line which cuts the river Cuyuni far above the point where it joins the Mazaruni and swells the Essequibo. On the other hand, the Venezuelans claim territory down to the waters of the Essequibo. The Venezuela map seizes the claim by confining Guiana Ingles to the comparatively narrow strip of country between the Essequibo and the Corentyn, this last river marking the boundary between British and Dutch Guiana. The disputed territory is virgin forest land, sparsely inhabited by Indians, and but for one fact the difference might never have reached a more acute stage than the publication of contradictory maps by the respective governments. That one fact is the presence of gold. About 20 years ago the precious metal was reported as existing in the neighborhood of the Cuyuni River, within the boundary claimed by the British Government. The colonists turned their attention to the matter; a gold-mining company was started, crushing machinery imported, and after great difficulty erected on the scene of operations. Gold was obtained, though not in large quantities. The Venezuelan Government learned of the affair, and made strong representations against what they considered a violation of their territory. As the outcome thereof, the Governor of the colony, acting under instructions from the home Government, issued a proclamation, declaring that the country in which the gold-mining venture was being carried on was in dispute; that pending the settlement thereof the British Government and that of Venezuela had agreed to consider it as a sort of "no man's land," and that any British subject going there would go at his own risk and peril. This led to the ruin of the mining company. The machinery was abandoned, and the new industry was strangled at its birth. Still, however, men were to be found to search for gold, and for some years past the quantity brought to Georgetown, the capital of the country, has been steadily increasing, the depression in the sugar trade having turned the thoughts of the colonists to other sources of wealth.

British Guiana includes the settlements of Demerara, Essequibo and Berbice, and is bounded on the east by Dutch Guiana, on the south by Brazil, on the west by Venezuela, and on the northeast by the Atlantic Ocean. The territory was first partially settled by the Dutch West India Company in 1580. It was from time to time held by Holland, France and England. It was restored to the Dutch in 1802, but in the following year was retaken by Great Britain, to whom it was finally ceded in 1814. It is impossible to specify the exact area of the Colony, as its precise boundaries between Venezuela and Brazil respectively are undetermined, but it has been computed to be about 109,000 square miles. The climate is hot, but not unhealthy. The mean temperature throughout the year is about 82° F. Georgetown has a population of over 50,000. The estimated population of the colony, on December 31, 1884, was 264,063, made up of aborigines, 7538; East Indians, 86,545; Chinese, 3695; Portuguese, 11,917; Africans, 4521, and natives of British and West Indian Islands, 149,544. Immigrant population on estates was composed of 15,251 East Indians under indenture, 45,924 not under indenture, and 2009 Chinese not under indenture. The revenue in 1884 was £160,932, and the expenditure £149,785; the public debt on December 31, 1884, was

£75,000; public bodies were owing at the same time, £125,303, guaranteed by the colony, for the most part, amply secured and including the emigration loan. Total value of imports in 1884, £1,990,418, and of exports, £2,322,032.

The staple products of British Guiana are sugar, rum, molasses, coffee and cocoa. There were 105 sugar estates in active operation in 1884, having an aggregate of sugar cane cultivation of 70,502 acres, and of plantain cultivation of 2553 acres. The sugar crop averages about 140,000 hogsheads annually; the bulk of the production is the high class sugar known as Demerara Crystals. Planters are reclaiming abandoned coffee estates, since this article has risen cocoa planting is being pushed vigorously, and on Coolie settlements rice is now being grown to a considerable extent. The latest advices from the colony state that men are leaving the stores and sugar estates and flocking to the diggings in great numbers. The advices also give fairly encouraging accounts of the labors of those already in the field. The final settlement of the dispute is all important to the Colony of British Guiana. If the territory is preserved to the British and if—as it seems more and more probable—it should prove rich in gold, the colony will receive a powerful impetus. Sugar prices are indeed so low that cane is scarcely worth growing.

The chief wealth for Venezuela is in her coffee estates, which produce 30,000 tons annually; the produce is now bringing a big price. Next to coffee, gold is the most prolific source of wealth, the "Callao" mine alone turning out during the first six months of last year 30,267 tons of ore of 2000 pounds, yielding bullion \$7,193 ounces, or per ton of 2000 pounds nearly 3 ounces. While, therefore, gold mining is pursued successfully with greater vigor than ever in the Territory of Yruari, Venezuela, bordering on the disputed Territory, British Guiana entertains seemingly well-founded hopes of rearing an industry equally prosperous on the strip of land it claims now as its legitimate possession. Should the latter be yielded to Venezuela, the Colony would be shorn of its most promising auriferous area. Gen. Guzman Blanco is once more the President of Venezuela, and by no means in a conciliatory mood toward England. While he was absent in 1885, a revolutionary attempt was made, got up in the neighboring British Colony of Trinidad, to upset the Government of his predecessor, President Crespo, and it very nearly succeeded. He is bound up with French capitalists and influences, and, being an ambitious and bold man, backed by public opinion in this matter, he is not likely to be easily overruled. The upshot is, however, likely to be arbitration and a compromise, since it is hardly probable that the matter will be carried to the point of actual war. During the administration of President Hayes there was a similar dispute between the Argentine Republic and Chili about the limits of Patagonia. President Hayes was appealed to to act as umpire, and the difference was satisfactorily settled. There have been numerous boundary disputes of the kind among nearly all the countries south of us, in a good many instances leading to war, but in as many cases overcome by arbitration. It is to be hoped that in this enlightened age this method of solving a difficulty may again be resorted to, and perhaps President Cleveland, if applied to, would not decline the task of cutting the gordian knot in a friendly manner between nations with whom we are in such important business relations.

Generally the frontier line existing at the time when Spain was still the owner of the greater part of countries south of us has been acknowledged as a fair basis for settlement; but in various instances the Spanish surveys had not been made conscientiously on the spot, but rather on paper; consequently the old Spanish frontiers are not always accepted as strictly correct, hence the difficulties.

Another difficulty has just arisen between England and the Haytian Republic. It is well known that England for a long time past has desired the acquisition of the Island of Tortuga, which commands the entrance into the Panama Canal, and of which she would like to make a second Gibraltar. This island is situated between Hayti and Cuba, and measures about 30 miles in length; it is well wooded and watered. The population consists of fishermen. England now demands of Hayti, the original owner of the island, an indemnity of \$1,000,000, through a commissioner just landed at Port-au-Prince, from the man-of-war Canada, Mr. Clement Hill, who claims the amount in behalf of a Haytian lady by the name of Mauger, whom he pretends to be an Englishwoman. This lady some time since obtained from the Haytian Government a concession for exploiting the logwood and mahogany, in both of which the island abounds. Hayti pretends that the terms of the contract were not fulfilled, that the payments to be made by her have not been forthcoming; the concession was consequently withdrawn and transferred to some Frenchmen. As at the same time the nationality of Mrs. Mauger is not satisfactorily proven, Hayti proposed that the difference should be submitted to arbitration, first proposing President Grévy and subsequently the United States. England answers by an ultimatum, supported by a naval force and threatening to shell the

leading Haytian ports unless the \$1,000,000 indemnity is paid forthwith. Advices have been received by cable from Port-au-Prince that there is great excitement in Hayti, and that the populace threaten to massacre all the white foreigners without distinction in the event of President Solomon yielding to this peremptory British demand. The Haytian President has appealed simultaneously to the United States and France for intervention and the protection of Haytian independence and domain. He has convoked the Legislature. On the 7th inst. the question was considered by the Cabinet at Washington with a view to the advisability of taking immediate steps, and a correspondence will be opened with Great Britain on the subject. A cable message via Cuba, of the 9th inst., expresses the belief that an amicable settlement will soon be reached.

The Question of Freight Rates.

SUSPENSION OF THE LONG AND SHORT HAUL PROVISIONS.

Upon application of the Southern Railway and Steamship Association, the Interstate Commerce Commissioners have suspended the long and short haul provisions of the law for 90 days, announcing meetings at Mobile, Atlanta, New Orleans and Memphis to consider the question carefully. This action of the commissioners seems to be wisely conservative, since the territory covered by the Southern lines is, owing to its circumstances, peculiar in its conditions. The trunk lines, generally speaking, find it an easy matter to comply with the new law; indeed, their tariffs have always been arranged upon that principle. From the chief cities of the South there are, however, several distinct routes to the North and West, these often crossing each other so that the long haul of one system is the short haul of another. An illustration will make this clear. From Macon, Ga., one route to New York is via Atlanta and the Old Dominion Steamship Company; another via Savannah and thence by steamship, but this same Savannah route is also a competitor for traffic from Atlanta, which it must carry through Macon to reach Savannah. As regards the Old Dominion lines Macon is further from New York than Atlanta, but as regards the Georgia coast steamships, it is much nearer New York than Atlanta. Hence practically these two places cannot take differing rates, for one line or the other will break the law. Again, to New Orleans and Mobile from the North the rates are much less than to Atlanta, which city is but little more than half way. The utmost caution is necessary in order that existing business arrangements should not be unnecessarily disturbed. On the other hand it is obvious that there must be some limit to the advance which it is fair to charge the interior town beyond the distant seaport. It is difficult to draw the line at which reasonable discrimination ends and injustice begins. It is at least a cause of thankfulness that the Commissioners approach the question with a determination to solve it in the interest of all as far as that can be determined.

This long and short haul question has lately come into great prominence in the United States, but is an old one in England. Compared with our own country England is small in extent, densely populated, and with seaports within short distances of each other. Imports from France or from America which could go direct to London by sea are stopped at Liverpool or Southampton and taken thence by rail. Of course the railroad proportion of the through rate from Germany or America to London is very much less than its local rate charged the cities on its own lines on the same articles to London. The farmer and the manufacturer claim that they are being driven from the London market by discriminations against them on the part of their own lines. To this the railways reply that if they did not take the freight and accept a low proportion the imports would go direct to London by water and the interior complainants be not one whit better off. But theories, no matter how plausible, at present fail to convince Englishmen, who find themselves undersold by foreign manufacturers and producers in their own markets.

The long and short haul problem in our own country is not so simple as it at first appears. Already we hear of protests on behalf of the river and ocean vessels whose trade would be enormously increased if the coast towns should be held up in freight rates to the standard of the interior. Then, too, well-equipped companies do not like the suspension of the law in any respect, and probably if they had their way would abolish many of the exceptions permitted. The Lake Shore and Michigan Southern system is considering whether it will not ask for a suspension of the rule on the ground of water competition, both lake and canal. The Pennsylvania system is interested in this, for although it has no water communication near it between New York, Pittsburgh, and Chicago, still it is a competitor of the Lake Shore, which has such opposition, and a concession granted the latter must, of course, concern every line competing with it by rail. Thus, in reality, there is not one town or city inland or on the coast which water competition does not affect.

We are glad to note that it is made a part of this suspension of the law in the South, that no advance in rates to or from interior towns shall be made beyond the prices in vogue when the suspension was published, and that in their hearings upon the question the National Commissioners order that specific instances and figures be named in any petition asking that the temporary suspension become permanent.

Wheeling Rates.—Freight rates between Wheeling, W. Va., and New York have been advanced to the following figures: First class, 49 cents; second class, 42 cents; third class, 33 cents; fourth class, 23 cents; fifth class, 20 cents; sixth class, 16 cents. By referring to the new classification recently published in our columns, the

freight charges on any articles can be ascertained. The rates as given apply upon traffic either East or West bound.

Iron Ore Rates.—The New York, Pennsylvania and Ohio Railroad have issued the following rates on iron ore from Cleveland, per gross ton:

Akron, Ohio; Warren, M. D., Ohio; Niles, Ohio; Leetonia, Ohio; Girard, Ohio; Brier Hill, Ohio; Youngstown, Ohio; Hubbard, Ohio; Sharon, Pa.; Wheatland, Pa.; West Middlesex, Pa.; Sharpsville, Pa.; Struthers, Ohio; New Castle, Pa., 85 cents.

Beaver Falls, Pa.; Chartiers, Pa.; Pittsburgh, Pa.; Bessemer, Pa.; Rankins, Pa.; Laughlin & Co.; Morehead, McLean & Co.; Elba Iron and Bolt Company; Linden Steel Company; Everson, Hammond & Co.; Allegheny, Pa.; Sharpsburg, Pa., \$1.50.

McKeesport, Pa.; Denier, Pa., \$1.72½.

Clapham, Pa.; Dunbar, Pa.; Lamont, Pa.; Everson, Pa.; Scottdale, Pa.; Fair Chance, Pa., \$2.

A terminal charge of 30 cents per ton is deducted from rates named above, for docking and handling at Cleveland.

The new rates of the Pennsylvania Company, operating the Cleveland and Pittsburgh Railroad, are as follows:

Mingo Junction, Steubenville, Brilliant, Martins Ferry, Bridgeport, Bellaire, Ohio; Wheeling, W. Va.; Pittsburgh, Allegheny, Pa., \$1.50.

Canton, Masillon, Leetonia, Canal Dover, New Philadelphia, Ohio; New Castle, West Middlesex, Wheatland, Sharon, Sharpsville, Shenango, Greenville, Pa.; Lowell, Struthers, Haselton, Youngstown, Brier Hill, Girard, Niles, Warren, Ohio, 85 cents.

Freights on Southern Pig Iron.—James R. Ozden, Commissioner of the Associated Roads of Kentucky, Tennessee and Alabama, has issued the following circular as the rates of freight on pig iron from Birmingham, Ala., and Chattanooga, Tenn., to points on and beyond the Ohio River, in carloads, per ton of 2268 pounds.

	From Birmingham, Ala.	From Chattanooga, Tenn.
Cincinnati, Ohio	\$1.03	\$3.50
Louisville, Ky.	87	8.50
Jeffersonville, New Albany, Evansville, Ind.	4.00	4.75
St. Louis, Mo.; East St. Louis, Ill.; Bellevue, Ind.; Indianapolis, Terre Haute, Ind.	4.50	4.25
Chicago, Grand Crossing, Pullman, Ill.; Michigan City, Ind.; Detroit, Port Huron, South Bend, Pekin, Mattoon, Atlanta, Ill.; Vandalia, Mo.; Toledo, Cleveland, Zanesville, Akron, Mansfield, Ohio; Pittsburgh, Allegheny, Wheeling, Steubenville, Bellaire, Bridgeport, Ohio	5.25	4.75
Lafayette, Ind.; Fort Wayne, Charleston, Danville, Ill.	5.00	4.75
St. Paul, Minn.; Columbus, Dayton, Springfield, Hamilton, Mill-boro, Ohio; Greenfield, Ind.; Mountsboro, Ironton, Ohio; Lima, Ohio; Newport, Ky.; Aurora, Ind.	5.00	4.50
East Saginaw, Mich.; Newark, Ohio; Joliet, Ill.; Gosport, Ind.	5.15	4.65
	5.50	5.25
	4.65	4.40

The rates from Chattanooga and Birmingham to all points South are about uniform—viz., \$1.35 to Atlanta, \$2.25 to Macon, \$3 to Savannah, Charleston, Augusta and Columbus, Ga., and \$3.75 to New York and Philadelphia, figures at which the lines are now signing bills of lading.

The "Representative Trade Journals of America."

The avenues by which the "bubble reputation" may be sought are many and various. One of these is opened to us by Mr. Frank L. Thresher, of Minneapolis, Minn., publisher of a most alluring scheme entitled, "Representative Trade Journals of America." To Mr. Thresher we are indebted for the following most flattering letter:

MINNEAPOLIS, April 2, 1887.
Editor of The Iron Age, New York.—DEAR SIR: I am compiling for publication, in picture form, the "Representative Trade Journals of America." It is to be a lithograph similar to the well-known picture "Representative Journals of America." It will contain a photograph of the journal, editor or business manager. Size of the picture will be 24 x 30 inches.

The following journals will comprise the list: Iron Age, Northwestern Lumberman, Railway Age, New England Grocer, Scientific American, Textile Record, American Stationer, Bradstreet's Weekly, Northwestern Miller, Druggist, Manufacturers' Journal, American Mining Journal, Paper World, Shoe and Leather Reporter, Jewellers' Circular and Horological Review, American Cabinet Maker and Upholsterer, Cultivator and Country Gentleman, Deconator, American Crockery Journal and Confectioners' Journal. Twenty thousand of the pictures will be published, and each journal will be supplied with 1000 copies.

You will readily appreciate the advantage of having your journal in this list when you consider that the pictures will be placed in 20,000 offices throughout the country and will remain in conspicuous places for many years. The many improvements in lithography during the past three years enable me to promise you that the picture will be the finest of the kind yet published. The expense to you will be \$300, payable upon demand after receipt of the pictures in a satisfactory condition.

I will require a copy of your journal carefully rolled, with the page you desire photographed designated, also a cabinet photograph of the editor or business manager of your paper with his autograph. Very truly yours, FRANK L. THRESHER.

We do, indeed, most profoundly appreciate the advantage to a journal like The Iron Age of appearing in the list mentioned, especially as it includes several journals which have hitherto escaped our notice, illustrating, doubtless, the law of "the invisibility of obvious things" formulated by the late Edgar Allan Poe. We also appreciate the delicate courtesy which prompts

Mr. Thresher to so shape his charming letter as to bring each of the journals selected at the head of the list in the letter sent to its office. But we appreciate very much more the brilliant originality of the scheme. Twenty trade journals at \$300 each would give the publisher \$6,000. Twenty thousand copies of the lithograph at two cents each would cost him \$400. Adding \$100 for lithographing and \$100 for postage and incidentals, if the scheme carries, he can count upon a clear profit of \$500, and if he is a good manager this can be somewhat increased. Whether this is tempting or not depends upon whether one is to make the profit in question or contribute to it.

If the lithograph so graphically described by Mr. Thresher is issued and finds its destiny in ornamenting the walls of 20,000 offices, The Iron Age may or may not be among the journals tastefully grouped upon it. If not, it will be because it was not our pleasure to pay Mr. Thresher \$300 for what would perhaps do us not more than 3 cents' worth of good, also, because we have modestly refrained from sending him a copy of our journal, carefully rolled, and a photograph. It is a beautiful scheme, but as there are others who are likely to value the opportunity more than we do, we waive our claim to appear among the 20 representative trade journals of the United States, content with the modest obscurity which is the price of exclusion from this brilliant galaxy.

Two Months' Imports of Iron and Steel.

The following, according to the official returns, were the imports of iron and steel during the months of January and February:

Articles.	1887.	1886.
Iron ore	228,884	141,346
Pig iron	48,831	47,455
Scrap iron	43,292	6,773
Scrap steel	2,710	389
Bar iron	4,359	3,067
Steel rails	39,547	3,067
Cotton ties	210	210
Hoop, band and scroll iron	92	92
Steel hoops, bands and plates	3,117	3,117
Ingots, blooms, billets and slabs	54,108	11,466
Sheet plate and tangers iron	71	71
Thin plates	29,199	35,152
Wire rods	32,019	39,210
Wire and wire ropes	487	411
Anvils, axes and forgings	311	23
Chains	111	59

The above figures show that in the majority of important lines the imports this year continue as heavy as they were last year. In iron ore, old rails, steel rails and billets, slabs and blooms there is a heavy increase. Probably the most interesting figure is that regarding the heavier quantities of steel plates imported. For some time foreign material of this kind has had a chance, and it has been vigorously pushed.

A Red-Hot Telephone Transmitter.

Experiments have recently been made in England with a red-hot wire as a telephone transmitter. An account of these has been communicated to the Royal Society, Prof. G. Forbes and Mr. John Munro. A fine platinum wire, from 0.001 to 0.005 inch in diameter, and several inches long, was included in the circuit of a charge accumulator, and the primary wire of an induction coil. A receiving telephone was connected in circuit with the secondary wire of the induction coil. The battery power was such that the fine wire in the primary circuit was heated to a high temperature and rendered incandescent. When in this condition, on speaking to it the words could be heard in the receiving telephone. The explanation of the phenomenon is, that the sound waves passing the incandescent wire in quick succession altered its resistance by cooling, and thus varied the strength of current in the primary circuit. The fluctuations of current thus caused excited corresponding fluctuations in the secondary circuit, and these reproduced the voice in the receiver. Spiral wires in the form of watch-springs, of steel and platinum iridium were tried in place of the straight wire with some success. An india rubber diaphragm was also interposed between the voice and the heat-wire, and found to influence the wire like the direct voice. Mechanical vibration did not affect the apparatus.

Special Agent Hanlon, in a recent report in regard to the classification of platinum imported in the form of ingots, sheets or wire, suggested a modification of the existing practice at New York by which such forms of platinum are classified under the provision in the free list of the tariff for "platinum unmanufactured." In his opinion such platinum should be subjected to a duty of 45 per cent. ad valorem under the provision for "manufactured articles or wares, composed wholly or in part of platinum or any other metal, whether partly or wholly manufactured." The Collector of Customs at New York, in a letter to the department on the subject, expresses the opinion that platinum in the shape of ingots, sheets or fine wire, if in the condition in which it was first impressed or drawn from the crude material, is still "unmanufactured" within the meaning of the present tariff; but that if platinum sheets and wire have undergone further process than that which brought the crude material into commercial platinum, then they fall within the provision of the tariff cited by the special agent for platinum partly or wholly manufactured. The United States Appraiser concurs in the views of the Collector, and the department has notified the latter officer that it does not feel called upon to act in the matter.

Prof. W. Kohlrausch has come to the conclusion that spiral springs are, on the whole, very reliable and subject to but little alteration. The greatest error likely to arise through their use in the construction of measuring instruments does not appear to exceed 0.5 per cent. In any instrument, however, in which the current is made to pass through the spring, care must be taken that the heating is not excessive. Steel is preferable to German silver as a material for the springs.

Trade Report.

British Iron and Metal Markets.

[Special Cable Dispatch to The Iron Age.]

LONDON, WEDNESDAY, April 13, 1887.

Scotch Pig.—The market is not so steady, Scotch Warrants closing 4 1/2, as against 4 1/2 at 7 last week. Make's brands are quoted as under:

Coltness, alongside Glasgow, 24 1/2
Langloch, " " " " " " 20 1/2
Glenarnock, " " " " " " 20 1/2
Gartsherrie, " " " " " " 18 1/2
Shotts, " " " " " " 18 1/2
Dalmellington, " " " " " " 18 1/2
Carnbroe, " " " " " " 18 1/2
Eglington, " " " " " " 18 1/2
Summerlee, " " " " " " 18 1/2
Vantage from Ardrossan to Glasgow is 1 1/2 ton.

Bessemer Pig.—The market is unchanged. We quote W. C. Hematites, Nos. 1, 2 and 3, 44 1/2 to 46 1/2.

Cleveland Pig.—The market shows no change, with closing quotations at 38 1/2 for No. 1 Foundry; 37 1/2 for No. 2; 36 1/2 for No. 3, and 35 1/2 for No. 4 Forge.

Bessemer Billets.—Bessemer Billets, 4 x 4 inches are 80 1/2 to 82 1/2.

Bessemer Blooms.—The market is irregular. We quote Blooms, 7 x 7 inches, 75 1/2 to 77 1/2.

Bessemer Crop Ends.—We quote run of mill 51 1/2 to 53 1/2.

Manufactured Iron.—The market is irregular. We quote:

	£	s.	d.	£	s.	d.
Staff, Ord. Marked Bars.....	6	10	0	6	10	0
" " " " " " " " " " " "	5	5	0	5	5	0
" " " " " " " " " " " "	4	15	0	4	15	0
Hoops, 2 1/2 W. G. and over.....	6	0	0	6	0	0
" " " " " " " " " " " "	5	10	0	5	10	0
" " " " " " " " " " " "	5	0	0	5	0	0
Sheets, 2 1/2 W. G. and under.....	6	15	0	6	15	0
" " " " " " " " " " " "	6	0	0	6	0	0
" " " " " " " " " " " "	6	0	0	6	0	0

Welsh Bars are quoted £4, 17 1/2.

Steel Rails.—The market is weaker, prices having declined to £4, 2 1/2 to £4, 5 1/2.

Old Rails.—The market is quiet and irregular. Prices are nominally 6 1/2 to 6 3/4, for T's, c.i.f. New York, and 6 1/2 to 6 3/4 for Double Heads.

Scrap.—With an irregular market, quotations are at the close 55 1/2 to 57 1/2, c.i.f. New York for Heavy Wrought Scrap.

Copper.—The market is unchanged, Chili Bars closing £39, 10 to £39, 15, and Best Selected, £44 to £44 10/16.

Tin.—The market is weaker, spot closing £100, 15 to £101, 5, and futures £101, 5 to £101, 15 1/2.

Tin Plates.—Tin Plates are a little steadier. We quote:

	£	s.	d.	£	s.	d.
Tin Plates, 10 1/2 x 11 1/2 qual. Charcoal.....	17	0	18	17	0	18
" " " " " " " " " " " "	15	0	15 1/2	15	0	15 1/2
" " " " " " " " " " " "	13	6	14 1/2	13	6	14 1/2
" " " " " " " " " " " "	12	6	13 1/2	12	6	13 1/2

Spelter.—The market is a little weaker. We quote £14 to £14 2 1/2.

Lead.—We quote £12, 15 for Common English Pig.

Freights.—Steam freights from Glasgow to New York are 7 1/2.

Financial.

Office of The Iron Age,
WEDNESDAY EVENING, April 13, 1887.

Business is in a waiting attitude pending the settlement of questions relating to freight transportation, and is not altogether satisfactory. Shipments are somewhat diminished as regards merchandise of every description. From Chicago eastward the aggregate shows a falling off compared with the previous week of nearly 30,000 tons. Nevertheless the bank clearings last week make a favorable exhibit as compared with 1886, the total for the whole country showing a gain of 15 1/2 %, and outside of New York 20 7/8 %. Only four cities report losses. The West continues to lead in the matter of gains, Omaha coming first with 100.2 % Boston reports an increase of 36 1/2 %, and New York 15 1/2 %, but in both cases the gain is largely due to the revival of speculation in stocks, produce, grain, cotton and petroleum. The market for wheat has been variable, but at the close was lower, partly owing to the increased visible supply. The European demand is light, from which circumstance speculators may discern the probability that India and Australia will supply the demands of the Continent, leaving the United States to carry their surplus for an indefinite period. The April report of the Department of Agriculture shows that the average condition of winter wheat is 88 as against 92 1/2 of year ago. The first arrivals of wheat by water for this season reached New York on Monday from Albany. Of dry goods considerable purchases were made for transportation by inland routes as soon as navigation is opened. Spot cotton is steady; demand light. Exports of cotton for seven months, as per report of Bureau of Statistics, have been 3,018,488 bales, or 155,000 bales more than for the corresponding period last year, an increase of nearly 20 %. Coffee speculation is wild and the business larger than for many months. India rubber is firm. Provision are fairly active in export account, at steady prices. Sugar is dull. Petroleum in moderate demand, prices unchanged. Ocean freights are low, with limited engagements; rates for grain, per steamer, below the paying point.

One week under the Interstate Commerce law has been sufficient to allay many apprehensions excited respecting the disturbance and derangement which the country was liable to suffer through its administration. The primary object of the law was to secure uniform and impartial rates in the transportation of freight; yet an imperfection was more than suspected when the commission, at the outset of their labors, were constrained to suspend the operation of the most important clause—relating to the long and short haul—upon the urgent application of railway companies in the South and West. In legal phrase, their action was generally construed as a temporary injunction, in some sense applicable to all routes affected by special competition from lake, river or canal. The Commissioners adjourned on the 7th to the 15th inst., pending a pressing inquiry from Boston with reference to allowing a drawback on grain intended for export. Charges on transcontinental freights from China as against rival routes in British Columbia and the Suez Canal also claim attention. As the week closes a report comes from Washington that the Commissioners are convinced of their ability to administer the law without prejudice to the business interests of any section.

The Stock Exchange markets have been generally strong, with the coal shares prominent. Prices were favorably influenced by the action of the Interstate Commissioners in suspending the operation of the long and short haul clauses on railroads in the Southwest. The bank statement also strengthened the market. On Monday the tone generally was heavy, and most of the active stocks closed at a decline. On Tuesday the market was more active under higher prices in London, and there was a further improvement in Jersey Central, Reading, Louisville and Nashville, and New England. To-day the first two mentioned, together with Western Union, made up the bulk of the trade, Jersey Central advancing 4 1/2 to 8 1/2 %. Favorable statements of earnings were received from the New York Central and Lake Shore.

United States bonds are quoted as follows:

	100	100 1/2	101	101 1/2	102	102 1/2
U. S. 3 per cents.....	100	100 1/2	101	101 1/2	102	102 1/2
U. S. 4 1/2 per cents.....	100	100 1/2	101	101 1/2	102	102 1/2
U. S. 5 per cents.....	100	100 1/2	101	101 1/2	102	102 1/2
U. S. 6 per cents.....	100	100 1/2	101	101 1/2	102	102 1/2
U. S. 7 per cents.....	100	100 1/2	101	101 1/2	102	102 1/2
U. S. 8 per cents.....	100	100 1/2	101	101 1/2	102	102 1/2
U. S. 9 per cents.....	100	100 1/2	101	101 1/2	102	102 1/2
U. S. 10 per cents.....	100	100 1/2	101	101 1/2	102	102 1/2
U. S. 11 per cents.....	100	100 1/2	101	101 1/2	102	102 1/2
U. S. 12 per cents.....	100	100 1/2	101	101 1/2	102	102 1/2
U. S. 13 per cents.....	100	100 1/2	101	101 1/2	102	102 1/2
U. S. 14 per cents.....	100	100 1/2	101	101 1/2	102	102 1/2
U. S. 15 per cents.....	100	100 1/2	101	101 1/2	102	102 1/2
U. S. 16 per cents.....	100	100 1/2	101	101 1/2	102	102 1/2
U. S. 17 per cents.....	100	100 1/2	101	101 1/2	102	102 1/2
U. S. 18 per cents.....	100	100 1/2	101	101 1/2	102	102 1/2
U. S. 19 per cents.....	100	100 1/2	101	101 1/2	102	102 1/2
U. S. 20 per cents.....	100	100 1/2	101	101 1/2	102	102 1/2

The bank return of the week shows a decrease of \$264,250 in surplus reserve, which now stands at \$4,115,475. The loans show a gain of over \$5,000,000, and it is inferred that the funds for this expansion were derived from Treasury disbursements, otherwise the surplus must have wholly disappeared. The money market is now turning easier, the tide of currency having worked toward this center. Exchange on New York in Chicago advanced to a premium. Scarcely anything is being done in commercial paper. We quote 60 to 90 days first-class, 6 %; longer dates, 6 1/2 to 8 %. Sterling exchange was strong, and the nominal rates were put up to 4.86 1/2 and 4.88 1/2 by some of the prime bankers. According to the Custom House report the exports of specie from this port during the week amounted to \$553,055, making a total of \$7,169,676 since January 1, as compared with \$21,237,000 for the same time last year, and the imports were \$161,522, making a total of \$4,390,491 since January 1, against \$5,128,457 for the corresponding period in 1886.

The industries generally are prosperous, excepting as threatened by an extensive strike of the molders in the stove trade, begun in St. Louis, and affecting the principal cities in the West. Over 3000 special returns to Bradstreet's indicate that in New England, Middle, Central and Western States there are over 400,000 more industrial employees at work than in 1885, after the period of depression. Wages received, considering that full time is now the rule, have advanced the average of from 10 to 15 per cent, about as much as they declined from 1882 to 1885. The Railway Age reports the mileage of completed railway construction for the first quarter of 1887 as 1040 miles on 49 different lines in 25 of the States and Territories. At this rate, track-laying for 1887 will aggregate from 5000 to 10,000 miles.

The importations of merchandise at this port during the week show a slight falling off, the valuation being \$8,727,258, including about \$2,000,000 in dry goods, making a total of \$125,585,000 since January 1, against \$128,035,000 for the same time last year, and \$113,011,000 in 1885. The exports show a considerable falling off, the valuation being \$5,200,178. The total since January 1 is \$52,741,030, as against \$53,007,000 last year, and \$49,658,000 for the same time in 1885. The items include 67,082 barrels of flour, 887,045 bushels of wheat, 207,694 bushels of corn, 21,080 bales of cotton, 5,530,750 gallons of petroleum, 3,207,515 pounds of cut meats, and 3,203,010 pounds of lard.

Tension-wheels for countershafts, where light machinery is being driven, are making quite a headway both in this country and in England. There has been too much power lost by tight and loose belts, and too much trouble to keep them in order. A very small amount of movement is all that is required to hold a belt under any degree of tension, and a slip-bearing resting on a coil spring regulates the tension to a nicety.

NEW YORK.

Business generally is very dull, all the leading works throughout the country being largely affected by the new rates on raw materials and manufactured products. It is found now that in many cases local freights have been sharply advanced under cover of the new law, although it has nothing to do directly with rates within the boundaries of a State. Generally speaking, there is a good deal of dissatisfaction, and the rates, if they stand, will cut off some makers from a good many markets which have been a general battle ground until now. Foreign material of all kinds is weaker, and is showing a downward tendency.

American Pig.—The market is very quiet, and buyers are more and more taking of possible lower prices, delaying purchases as far as possible. The only pressure there is to sell is on the part of those who have just blown in furnaces. This, in reality, does not mean much, since the plants which have come in lately are nearly all of them small, so that it is dangerous to draw exaggerated inferences from the number of such sellers as to the quantity of product they represent. We publish elsewhere our usual monthly statistics, in connection with which we wish to emphasize that recent and prospective increase of capacity at work is chiefly on Bessemer grade. Statistically the position of Pig Iron is still exceedingly sound. Sales in this market have only been on a small scale. We quote nominally \$21 to \$21.50 for No. 1 Foundry, \$19.75 to \$20.50 for No. 2 Foundry, and \$18.50 to \$19 for Gray Forge in round lots.

Scotch Pig.—The market is dull and quiet. We quote for round lots, to arrive: Coltness, \$21.75 to \$22; Glenarnock, \$21.50 to \$21.75; Shotts, \$21.50 to \$22; Carnbroe, \$21 to \$21.50; Clyde, \$20.50 to \$21; Summerlee, \$21.25 to \$21.75; Dalmellington, \$20.50 to \$20.75; and Eglington, \$20 to \$20.50.

Bessemer.—Foreign is freely offered at \$20.50, and business would probably be done by sellers at close to \$20, ex-ship for Foreign. We do not hear of any sales. Some Domestic is offered by one or two furnaces which have lately gone in on Bessemer.

Spiegel.—The market is very dull and is tending downward, with 20 % freely offered at \$27.50.

Bar Iron.—The market is dull at 1.95¢, 2¢ for Common, 2¢ to 2.10¢ for Medium, and 2.15¢ to 2.50¢ for Refined.

Plates.—We quote for round lots: Common or Tank, 2.35¢ to 2.50¢; Refined, 2.50¢ to 2.60¢; Shell, 2.7¢ to 2.8¢; Flange, 3.7¢ to 3.8¢; Flange, Extra, 4 1/4¢ to 4 1/2¢. For small lots of Steel Plates quotations are as follows: Tank, 2.85¢ to 3¢; Ship, 3¢; Shell, 3.25¢ to 3.50¢; Flange, 3.60¢ to 3.75¢, and Fire-Box, 4.35¢ to 4 1/2¢, on dock.

Steel Rails.—Offerings of lots for re-sale continue to depress the market. While the quantities are not large in the aggregate, the fact that they are hawked about in blocks of 5000 tons and less, at prices considerably below the lowest rates made by the mills, causes a temporary stagnation. Buyers are always suspicious of such Rails from second hands, and they can never be placed at full figures. One lot of 10,000 tons, held by a speculator, which has been on the market for some time, has been taken by two parties who, it is understood, are not consumers, however—6000 tons of it was taken by the mill which originally sold the Rails. Outside of this lot a firm of contractors are reported to be offering some round blocks. Aside from a number of sales of small lots, and a fair amount of Seconds and Light Rails, Eastern mills report no business. In the West a number of inquiries have come up. Among them a lot of 10,000 tons for a road which has already bought heavily, 7000 tons for an Illinois road, 6000 tons for an Ohio road, and a number of 2500 to 5000-ton lots for Kansas, Missouri, and the Southwest. We note also an inquiry for 6500 tons in addition to heavy previous purchases for a leading Eastern trunk line. In the aggregate these inquiries will foot up at 50,000 to 60,000 tons. We quote, nominally, \$39 to \$40, at mill.

Blooms and Billets.—The market is very dull and is weaker, with Rail Blooms shipment nominally \$20.50 to \$30, and 4 x 4 inch Billets \$31.50 to \$32.

Old Rails.—The only transaction of any consequence reported is the sale of 1000 tons Foreign Double-Heads on canal boats, Perth Amboy delivery, to a New Jersey mill, at \$22.50, being a lot resold by a Western mill. The market is still mixed. Importers state that their European connections insist that the weak holders abroad have been pretty well crowded out, while on this side there are only occasional lots afloat, which are in the hands of outside speculators who must realize. Some report also that a few consumers have shown a disposition to pick up cheap lots, and it is rumored that a pool is being formed to take hold of the market. On the other hand, there is little doubt that the heaviest consumers are supplied far ahead, and show little inclination to touch the market. We quote Double-Heads \$22 1/2 to \$22.50, and T's \$22.

Scrap.—The market is dull and weaker, with Yard Scrap at \$23.50 to \$24, and Foreign, for shipment, \$21.50 to \$22. We note

a sale of 250 tons Choice Domestic at private terms.

Rail Fastenings.—The market is weaker under offerings of outside lots. We quote Spikes, 2.50¢ to 2.70¢, delivered; Angle Fish Bars, 2.20¢ to 2.25¢; Steel Angle Bars, 2.25¢; Bolts and Nuts, 3.15¢ to 3.20¢, and Bolts and Hexagon Nuts, 3.30¢ to 3.40¢.

Messrs. N. L. Cort & Co., of 245 and 247 Water street, New York, have issued a small pamphlet giving the cost of tin roofing per square and per square foot, at different prices of the plate per box. They publish tables of the weight of sheet zinc, sheet iron, Russia sheet iron, the cost of iron wire in bundles, the number of yards to a bundle, &c.

Philadelphia.

Office of The Iron Age, 230 South Fourth St., PHILADELPHIA, April 12, 1887.

The week past has been one of continued inactivity, with increasing anxiety on the part of holders and in not a few cases very decided weakness in prices. The feeling is still hopeful, however, although confidence has been much impaired during the past two or three weeks. The unsettled condition of freights is the most disturbing element, it being almost impossible to obtain rates with anything like definiteness. As an illustration of this, we were informed to-day by the head of a large Iron concern that he had just been over to the Reading Railway in regard to four important shipments to points on their roads, but could not get a rate named on any one of them. Under such conditions it is not to be wondered at that business is dull.

Pig Iron.—The market has been very dull, and a revival of activity seems to be as far off as ever. The supply is still very moderate, not more than enough of standard brands to go around, but offerings from other sources give an appearance of sufficiency that is rather discouraging. An ordinary revival of the demand would probably steady the market at about present prices, but there is such a feeling of uncertainty that no one knows what to expect, so that whenever there is a chance of effecting a sale prices are not very rigidly adhered to. Everybody is waiting for everybody else before taking steps toward entering into new engagements, consequently it is impossible to say how long the deadlock may continue. The buying movement may set in again as it did a few months ago, and, on the other hand, there may be a mere hand-to-mouth business all summer. The great obstacle to a renewal of contracts on a large scale is the very large output from week to week, the largest in the history of the country, and the knowledge of this fact makes consumers indifferent in regard to placing orders in advance of their requirements. The feeling of abundance is so strong and so general that people cannot be frightened into making much provision for the future. As regards the outlook for consumption, it is believed to be good, probably larger than for years, but in order to maintain prices it must be in proportion to production, and this is just where the difficulty comes in. The chances appear to be that the future was discounted a little too freely some time ago, and while consumption may be large there is reason to fear that the supply will be larger still, in which case there is but little prospect of anything better than we have had for several weeks past—dull, heavy markets and gradually declining prices. Much will depend, however, upon the outcome of events during the next couple of weeks, and in the meanwhile quotations for standard brands are about as follows: Tide-water delivery, No. 1 Foundry, \$21.50 to \$22; No. 2 ditto, \$20 to \$20.50; Gray Forge, \$19 to \$19.50. There are some brands that can be had at probably 50¢ to \$1 less money, according to circumstances—new brands, brands barely up to standard in quality, or brands that may be pressed for sale for financial or other reasons. The range of prices is very wide, so that the figures named are to some extent nominal, and confined probably to a few good makes.

Foreign Iron.—Nothing doing, asking prices same as last week, viz.: \$20.50 to \$20.75 for Bessemer, and \$27.50 to \$28 for 20 % Spiegel, c.i.f., duty paid.

Blooms.—The market is very dull, and prices could be shaded on offers for good-sized lots. Asking figures about as follows: Rail Blooms for shipment, \$29.50 to \$30.50; Nail Slabs, \$30.50 to \$31.50; Sheet-Iron Billets, \$34 to \$36; higher qualities for Boiler Plate, &c., \$38 to \$42. American Blooms as follows: Charcoal Blooms, \$55 to \$56; Runout Anthracite, \$47 to \$48; Scrap Blooms, \$38 to \$39, and Ore Blooms \$30.50 to \$37 1/2 "bloom" ton.

Muck Bars.—Demand light, but prices have been fairly maintained at about \$33.50 at mill. In exceptional cases higher figures have been named, and in others with less favorable deliveries \$33 has been quoted, but the market is irregular and prices rather uncertain.

Bar Iron.—The feeling is said to be a little better in some quarters, but in others there is still a good deal of anxiety for new business. Since the first of the month, orders for Car Iron have been taken at figures far below the market, and in the present basis of cost, it is difficult to see how

the sellers can get their money back. A considerable amount of business has been secured, however, and, as that was the object, it may be supposed that the parties are satisfied, although it is said that they refused to enter more at the same figures. A very general quotation is 2 1/2¢ to 2 1/2¢ (the nominal rate 2.2¢), but 2¢ and even less has been accepted for a strictly first class quality of Iron. As remarked before, however, there is a little better feeling, and it is not likely that much below 2 1/2¢ would be accepted, unless the order was specially desirable, or the mill very much in need of work. In this respect reports are somewhat contradictory, although it is quite safe to assume that there would be no difficulty in placing orders at the rate named, if they were offered. Skelp is also a little off, quotation nominally 2.2¢, but probably 2 1/2¢ to 2 1/2¢ for Grooved, and 2 3/4¢ to 2 1/2¢ for Sheared, would be fair average quotations.

Plate and Tank Iron.—There is only a moderate demand, and some of the mills are beginning to feel the want of orders rather severely, so that prices are not as steady as they were some time ago, notwithstanding the 10¢ or 15¢ reduction in quoted rates. Prospects are pretty good, however, and with a settlement in the rates of freight, a better demand is somewhat confidently predicted. In most cases manufacturers now quote mill prices, which are about as follows, f.o.b. cars: Ordinary Plate, 2.3¢ to 2.35¢; Tank, 2.4¢; Shell, 2.6¢ to 2.7¢; Flange, 3.65¢; Fire-Box, 4.5¢ to 4.6¢; Steel Plates, Tank, 2.8¢ to 3¢; Shell, 3.15¢; Flange, 3.4¢; Fire-Box 4¢ to 4.5¢.

Structural Iron.—There is not much to report this week, as new business comes in slowly, although there is quite a number of inquiries in the market, and prospects in several instances are rather favorable for an early placing of orders. The mills are tolerably well supplied with work for the present, and in view of an expected early renewal of contracts are disposed to hold prices firm at last week's rates—viz.: 2 1/2¢ to 2.5¢ for Bridge Plate; 2.30¢ to 2.35¢ for Angles; 2.8¢ to 2.9¢ for Tees, and 3.3¢ for Beams and Channels.

Sheet Iron.—The demand keeps up very fairly considering the present unsettled condition of things. Sales are said to compare favorably with the output, and prices are held at about the following rates for best qualities:

	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	
Best Refined, Nos. 26, 27 and 28.....	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	
Best Refined, Nos. 12 to 25.....	3 1/2	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50

Trade Report.

tion is suspended, so far as running coal is concerned, and river men especially and those having contracts are getting uneasy. There is usually a rise in the river in April and May, however, and this may come any day. There is a large quantity of Coal here loaded and ready for the down-river markets as soon as there is sufficient water. The quantity is from 12,000,000 to 15,000,000 bushels. The railroads continue very busy, and manufacturers report trouble in getting cars promptly. This complaint has been common for several months past.

Pig Iron.—Some of the brokers report more business, and all look for an improved trade before the close of the month. There is no falling off in consumption, while stocks in the hands of consumers are being rapidly depleted, and will soon have to be replenished. The supply of desirable Irons is by no means excessive, and while unknown Irons are offering pretty freely, the former are held at full prices. No. 1 Neutral Forge Iron may be fairly quoted at \$20, cash, a decline of 50¢ per ton, as compared with the highest point. Quotations may be fairly given as follows:

Neutral Gray Forge	.....	\$20.00 @ \$21.00, 4 mos.
All Ore, Mill	.....	20.50 @ 21.50, 4 "
White and Mottled	.....	19.00 @ 19.50, 4 "
No. 1 Foundry	.....	22.00 @ 22.50, 4 "
No. 2 Foundry	.....	21.00 @ 21.50, 4 "
No. 3 Foundry	.....	19.50 @ 20.00, 4 "
Foundry Charcoal, No. 1	.....	24.50 @ 25.00, 4 "
Foundry Charcoal, No. 2	.....	22.00 @ 22.50, 4 "
Cold Blast Charcoal	.....	28.00 @ 30.00, 4 "
Bessemer Iron	.....	23.00 @ 23.50, 4 "

Black Bar.—The market has been very quiet during the past week, but there are negotiations pending covering several thousand tons; some of which will be closed within a few days. We quote at \$34 @ \$35, cash, as to quality, delivery, &c. It is said that there is a very fair margin of profit at present prices.

Manufactured Iron.—There is a fair degree of activity; mills are generally pretty fully employed, and the indications are that this will continue all summer. Full card rates are being realized and there is no necessity for cutting. Prices are close, cost of production considered. We continue to quote upon a basis of 2¢ for Bars, 50 days, 2¢ for cash. Some mills are now working almost entirely on Skelp Iron, the manufacture of which is becoming very large in Pittsburgh.

Nails.—There was a regular meeting of the Western Nail Association last Wednesday, but beyond the election of officers for the ensuing year there was nothing of importance done. The trade continues dull for the season, but now that spring has fairly opened an improved demand is confidently looked for within the next week or two. Card price remains unchanged, but desirable orders are still being taken considerably below the card rate. It is generally conceded now that the last advance in the card was a mistake, as it could not be realized at any time since it was made.

Wrought-Iron Pipe.—The demand continues to improve, and it is probable that the mills will soon be busy. It is true that they are all busy now, but some have been working up common assorted stock for the jobbing trade. Discount on Black Butt-Welded Pipe, in carloads, 35¢; on Galvanized do., 25¢; on Black Lap-Welded, 52½¢; on Galvanized do., 35¢; Casing, all sizes, 45¢; Boiler Tubes, 42½¢; for 2-inch Tubing, 16¢ per foot net; 6-inch do., 75¢; 2-inch Line Pipe, 14¢; 6-inch do., 75¢; 8-inch Drive Pipe, \$1.40.

Old Rails.—There have been some sales during the week, but trade continues light, and it is not likely to improve much until the market becomes more settled. Consumers here, and it is no doubt the same elsewhere, are buying only for their immediate requirements, and they will probably adhere closely to this policy as long as there is a possibility of prices getting lower. Brokers are here almost every day from the East working hard to make sales, but they meet with little success. We can report a sale of American T's for prompt delivery at \$27.50. For Foreign T's, for delivery on the reopening of canal navigation, at \$25.50 and of Foreign Doubles at \$26.

Billets, &c.—Bessemer Brooms and Billets, American, may be quoted at \$35.50 @ \$36, and ditto Nail Slabs at \$34.50 @ \$35. Sales of Foreign Billets, delivery at Pittsburgh, \$35. A sale of Wire Rods, American, reported at \$15.50.

Steel Rails.—Manufacturers continue to report Heavy Sections at \$41 @ \$41.50, cash at mill, for near by delivery, but the mills are in no condition to accept orders for immediate delivery, as they are all sold ahead.

Railway Track Supplies.—There is a continued fair business, and prices remain unchanged. Spikes, 2.75¢, 30 days' delivery; Splice Bars, 2.20¢ @ 2.30¢; Track Bolts, 3.30¢ @ 3.40¢, with square and hexagon nuts. The indications are that there will be a good trade all summer. It is said there will be 12,000 miles of new railroad track built this year, so that a good demand may be expected for all kinds of supplies.

Old Material.—The stock continues light, but increased offerings are looked for soon, as it is customary with all Western mills to clean up at this season of the year, and dispose of their Scrap. Prices remain about as last quoted. We are advised of

sales of No. 1 Wrought Railway Scrap at \$26.50, net, and Railway Car Axles at \$32; No. 1 Axle Turnings quotable at \$19 @ \$20; Cast Scrap, \$18.50 @ \$19, gross; Cast Borings, \$14 @ \$15, gross. Nothing doing in Old Car Wheels, and in the absence of sales we omit quotations. Open-Hearth Steel quoted at \$23.50 @ \$24, gross, and Crucible ditto at \$26 @ \$27, net.

James H. Logan, iron and steel broker, of Pittsburgh, removed his office on the 1st inst. from No. 93 Fourth avenue to Room 804 in the new Penn Building, recently erected in that city.

Chattanooga.

Office of The Iron Age, Carter and Ninth Sts., CHATTANOOGA, TENN., April 11, 1887.

General business for the past week has been very much interrupted by the Interstate bill. Although some of the obnoxious features of the bill have been temporarily modified, yet the uncertainty that still exists is embarrassing business in no small degree. It is generally thought, however, by many of the leading business men that time and the Supreme Court will eventually dispose of the vexed question altogether.

Pig Iron.—There is very little that can be said about this article just at present. Sales are few, yet prices are firm, and it is doubtful if much could be bought for less than the price of two weeks ago. The idea appears to prevail among the principal producers that it will be but a short time before equitable rates will be secured to all Northern and Western points upon a permanent basis, when there must certainly be a more spirited demand from these sections. During the week past there has been one round lot of Gray Forge sold at \$15.75 at the furnace, and some other lots are being negotiated for on about the same basis. The furnaces have all been running quite regularly and turning out about their full capacity. Dayton, No. 2, was blown in, and so far has started off under very favorable auspices. As yet there have been but small accumulations of Pig in yards, many of the furnaces being sold ahead for nearly the first half of the year.

Miscellaneous.—Among the new enterprises of considerable magnitude in this district is the Chattanooga Cooperage Company, who have commenced the construction of their buildings and will complete them and get into operation as soon as possible.

Birmingham.

BIRMINGHAM, ALA., April 11, 1887.

The whole Iron trade is a little steadier than it has been since the decline of several weeks ago, and on all sides a long period of heavy and satisfactory business is anticipated. The manufacturers, who were most apprehensive of increased importation, now seem to have no great fears on that score, and so feel more comfortable than they did when they were getting a little more money for their product.

Pig Iron.—No. 1 X, \$17 @ \$17.50 at the furnaces. Several short-time sales have been reported for the last few days at the outside figure, and one small transaction at a little better, no price being given. No. 1 Mill has sold at \$16; one sale has been made to Pittsburgh, though not quite as good a price as the figures above would suggest. Prices are steadily higher at 25¢ or more from the West as compared with those from the East, although the new freight rates still naturally affect the former more seriously than the tide-water markets. Anyhow, production is about up to the average, but will probably be cut a little short for the next few weeks. The burning of the whole superstructure of the Pratt shaft on the 8th stops the largest single coal supply in the State, and with it an extensive coke plant. The management of the Mary Pratt furnaces have already been notified that it will be advisable for them to shut down, and, although a resumption of work at the shaft is promised within three weeks, they will at least bank for a few days. Before this accident the coke situation was rather more comfortable than it has been for some months. As an example of the normal increase in production it is worth mentioning that the Williamson Iron Company have lately made as much as 71 tons of Iron a day with their 13 foot furnace.

Finished Iron.—Has fallen back 10¢ on an average—a little more than enough to offset the reduced cost of materials. The demand is still amply sufficient for manufacturers to feel sure of good prices for as long a time as can be forecast. Before a great while now the product of the district in this line will be very largely increased.

Nails.—Several small cuts between the mills of the State and others more distant have brought Iron Nails down to \$2.50, delivered here. Steel Nails having also gone off some 25¢, may be laid down at \$2.50.

Miscellaneous.—The Iron working enterprises of the city all have sufficient business booked for comfort, but none of them any new orders worthy of note here. The single item of street railroad construction about the town would be almost enough to keep a small rolling mill and foundry busy. There is always something new to report nowadays under the head of new enterprises. An assured \$50,000 iron bridge concern in the city and another probable one a good

deal larger at Gate City, are about the newest things just now. At the last-named place ground has been broken for a large Brick and Terra Cotta concern. Another large Sash, Door and Blind Factory is promised, and several other things of about usual importance in building materials of one kind or another. The East Birmingham Iron Roofing and Corrugating Company and the Birmingham Machine and Foundry Company, both of East Birmingham, are receiving their machinery.

Cleveland.

CLEVELAND, April 11, 1887.

Iron Ore.—Dealers have had a lively week, although only one large transaction—50,000 tons—is reported. Bunks of from 500 to 5000 tons have sold freely at the same quotations furnished for several weeks. The market is evidently maintaining its strength, a feature not likely to be disturbed for a month or more to come. Business in non-Bessemer has been good, and Hematites have had a fair sale. The fact that rail freights to several points have been established has helped the market considerably. To the Mahoning, Shenango and Tuscarawas valleys the rate is 55¢; to Pittsburgh and Allegheny, \$1.50, and to the Johnson district, \$1.75. For No. 1 Specular and Magnetic Bessemer Ores quotations continue at \$6.75 @ \$7.25, and for the same brand in non-Bessemer, \$5.75 @ \$6.50. Bessemer Hematites are quoted at \$5.75, and non-Bessemer at \$5.00 @ \$5.50.

Pig Iron.—Until the question of freight rates is fully settled buyers will continue purchasing in dribbles. It is certainly true, however, that business has been better the past week than for the week before. There seems to be a general desire among furnaces that prices should remain stationary. They will at least be satisfied if present rates can be maintained. Charcoal Iron is in very good demand at \$20.50, at the furnace.

Scrap Iron.—The market is weak, and prices are anything but firm and stationary. Old Rails are quoted at \$26, but are offered for July delivery at \$25. For Old Car Wheels, \$20 is the average quotation.

Manufactured Iron.—Bar Iron is firm at \$2.20, and dealers have booked orders for several months ahead.

Coke.—Quotations continue at \$2 for Furnace, and \$2.25 for Foundry. A very good business is being done.

Cincinnati.

CINCINNATI, April 11, 1887.

Pig Iron.—"There is no market and affairs are stagnant," replied a local representative of a Southern company in answer to an inquiry concerning the condition of the Pig Iron trade in Cincinnati, and there is scarcely one with whom you may speak but will assert the same opinion. With scarcely an exception, any individual in the business community will break out into a dissertation respecting the ill effects of the Interstate Commerce bill when broached concerning trade in any line. In fact, the general tendency is to date all dullness or a retrograde movement in trade either to the time of the conception or the time of the birth of this new law. That the local Pig Iron market is dull is obvious, but that it is less stagnant than for several weeks past is also obvious. Nothing can kill the vitality of the trade in this country. The new law may cause a temporary paralysis, but trade will soon adjust itself to the new provisions or the law will prove inoperative—will become a dead letter—if not modified to an equitable basis. Producers continue to assert the present strength of the market, and cite various conditions as pointing out the probabilities of the maintenance of prices in the summer and fall months, but consumers have conceived no reasons for modifying their views of an easier feeling, and as far as mill iron is concerned they are fortified by actual sales on a lower basis, several 1000-ton lots, aggregating upward of 6000 tons, having been sold for summer and fall delivery during the week on the basis of \$19.50 for No. 2 Mill; but, while Mill Iron has thus developed a weaker tone, no such tendency has been shown by Foundry grades. The lower prices for Mill Iron is accounted for by the fact that more Mill and less Foundry Iron was produced by the furnaces than had been intended, and that, while there was such a surplus of Mill, there was and is a proportionate scarcity of Foundry Iron, and consumers are pushing the furnaces for this latter Iron upon old contracts. It is thus seen that there is a relative, rather than a total, change in the condition of the market. If this surplus Mill Iron is disposed of, and henceforth more Foundry than Mill grades are produced, the market will speedily adjust itself, other conditions which are more stable remaining the same. It is claimed, however, that buyers are holding aloof from the market, even borrowing from one another, rather than purchase upon the market; still there is a fair run of carlot and other small orders to bridge over pressing and immediate wants, for which full prices are obtained. The prices current are without essential change, being quoted as follows for cash, f.o.b. cars at Cincinnati:

Charcoal Foundry.	
Hanging Rock, No. 1	..... \$24.50 @ \$25.00
Hanging Rock, No. 2	..... 23.50 @ 24.00
Southern No. 1	..... 23.00 @ 23.50
Southern No. 2	..... 22.00 @ 22.50

Coal and Coke Foundry.

Ohio Soft Stonecoal, No. 1	.....	21.00 @ 21.50
Ohio Soft Stonecoal, No. 2	.....	20.00 @ 20.50
Southern Coke, No. 1	.....	22.00 @ 22.50
Southern Coke, No. 2	.....	21.00 @ 21.50
Ohio and West Pennsylvania Coke, No. 1	.....	20.00 @ 20.50
Ohio and West Pennsylvania Coke, No. 2	.....	19.00 @ 19.50

Forge.

Strong Neutral Coke	.....	19.50 @ 20.00
Mottled	.....	19.00 @ 19.50
Southern Coke	.....	19.50 @ 20.00

Car Wheel and Malleable Irons.

Southern Car Wheel	.....	27.00 @ 28.00
Hanging Rock, Cold Blast	.....	21.00 @ 22.00
Hanging Rock, Warm Blast	.....	21.50 @ 22.50
Lake Superior Malleable	.....	26.00 @ 27.00

Manufactured Iron.—The condition of the market has changed but little, a good demand is experienced, and full prices are realized. We quote: Bar Iron, 2¢ @ 2.10¢; Charcoal Bar Iron, 3¢ @ 3.10¢; Sheet Iron, Boiled, Nos. 10 to 27, 2¼¢ @ 3¼¢; Sheet Iron, Charcoal, Nos. 15 to 25, 3¼¢ @ 4¼¢ @ 5¢.

Scrap Iron.—There has been a better inquiry for Wheels, but little demand for Rails, and prices remain nominal at \$26.50 @ \$27 per ton for Old Rails, and \$20.50 @ \$21 for Wheels. Wrought and Cast Scrap are little better than nominal.

Nails.—Have been in fair jobbing demand, and steady, at \$2.70 @ \$2.75 per keg for Steel, and \$2.50 @ \$2.60 for Iron, 10d. to 60d., and other sizes at proportionate rates.

Chicago.

Office of The Iron Age, 36 and 38 Clark St., CHICAGO, April 11, 1887.

The situation has changed very considerably since our last report was written. The railroad companies have more generally announced their new rates than was then the case, and it is found that to many points they are so high as to prohibit trade in heavy goods with this market. The opening of navigation with Northern and Eastern lake ports is consequently awaited with the keenest anxiety, but, of course, this will only afford partial relief from heavy freight charges. Interior points located at a distance from water routes are placed at a serious disadvantage, and there is a loud cry for relief from the strict interpretation of the Interstate Commerce law, which is being made to their injury. Chicago merchants find their business suddenly involved in perplexities, which are very disheartening to those who have for years made a thorough study of freight matters and had acquired a knowledge in that direction, which was of inestimable value. The mercantile community is not alone in suffering from the effects of the new order of things, but manufacturers are also injuriously affected in having the cost of their raw materials enhanced by dearer freights. While there is still a fair amount of business in progress in most branches of the Iron trade, it is almost entirely in the hands of those so situated as to be the least affected by the new freight rates. In some instances this is the result of gross discrimination, as in the case of Southern railroad companies, which are permitted by the Interstate commissioners to continue to make through rates to the Northwest low enough to enable Southern Pig Iron to reach points beyond Chicago, from which Chicago merchants are debarred by prohibitory rates on local roads. Another disturbing element in the local Iron trade is the carpenters' strike, which is now in its second week, and which it is feared may seriously interrupt the erection of new buildings. Many of these projected buildings are of such a character that a great deal of Iron would be consumed in their construction outside of Nails and Hardware.

Pig Iron.—Furnace agents report trade at a standstill for reasons stated above, except in the case of Coke Iron manufactured in the immediate vicinity, for which there is a better demand, as might be expected. Inquiries for Charcoal Iron are quite numerous, and the indications favor a very good volume of business in that line, if freight rates were favorable. Arrangements are being made for shipments by water wherever available, and in a short time furnace agents will be in a position to name reasonable rates to a considerable part of the territory served by them. The price of Briar Hill Iron has been advanced 50¢ per ton to meet the advance in freights. Other Irons are nominally quoted at former prices, which are as follows, cash, f.o.b. Chicago:

Lake Superior Charcoal, Nos. 1, 2 and 3	.....	\$23.50 @ \$24
Blackband Coke Softeners	.....	\$24 @ \$24.50
Hanging Rock and Jackson County Soft	.....	\$22.50 @ \$23
Straight Coke Foundry No. 1	.....	\$22.50 @ \$23
No. 2	.....	\$21 @ \$21.50
No. 3	.....	\$20 @ \$20.50
Coke Bessemer, run of furnace	.....	\$23

Bar Iron.—A fair business was transacted during the week in lots ranging from a carload to several hundred tons. Prices have not been so firmly held, and rumors of shading are frequent. Quotations on full base sizes range from 2.15¢ to 2.25¢, on cars from mill, but favorable specifications are treated with much consideration. Store trade has been very good at prices ranging from 2.25¢ to 2.45¢, according to quantity and quality.

Structural Iron.—The outlook in this branch continues very good. Local troubles in the building trades may affect the demand for Iron in Chicago, but a great deal will be needed at outside points tributary to this

market, as well as for bridges, &c. Prices continue as follows: Beams and Channels, 3.5¢ from store; Angles, 2.5¢ @ 3¢ from store, and 2.0¢ on cars from mill; Tees, 3.25¢ from store; Universal Mill Plates, 2.75¢ on cars from mill.

Plates.—Trade continues in fair condition. Prices from store are as follows: Iron Tank and Heavy Sheet, 2.0¢ @ 3¢; Shell, 3.25¢; Flange, 4.25¢; Steel Shell, 3.5¢; Flange, 4.25¢; Fire box, 4.75¢.

Sheet Iron.—But little is being done in this line at present. Common Black is still quoted at 3.25¢ on cars from mill for No. 27, and 3.45¢ from store. Galvanized Iron is quiet in comparison with the heavy business of March, but is still moving fairly, with manufacturers' agents' prices firm at 62½¢ discount for Juniata, and 62½¢ and 2¢ off for Charcoal, while jobbers quote 50¢ and 15¢ for Juniata and 60¢ for Charcoal.

Merchant Steel.—A good demand is reported for Steel from store, its use growing continually. Prices again show a stiffening tendency. Orders for syndicate Steel are being received from repairers and jobbers. Quotations continue as follows: Ordinary Tool Steels, 8¢ @ 8.5¢; Specials, 13¢ @ 20¢; Spring, 3¢ @ 4¢; Sheet, 7¢ @ 11¢; Bessemer and Open Hearth Machinery, 3.1¢ @ 3.25¢.

Steel Rails.—No new business is reported, the local mills being busy as usual for months to come. The North Chicago works are expected to start up again on Monday next, when repairs will be completed.

Old Rails and Wheels.—Consumers of Old Rails are well supplied for the present, and not in the market. Accordingly, no transactions are reported, but offers of Rails have been made at \$26.50 for immediate delivery, and \$25.50 for next month's delivery. Nothing has been done in Old Wheels.

Scrap.—A better feeling is reported. Buyers find that there is not so large a quantity of material coming on the market as they had expected, and some of them find themselves compelled to lay in stocks. Quotations are as follows: 7 ton of 2000 lb.: Railroad Shop or No. 1 Forge, \$24; Railroad Track, \$22; Mill or No. 1 Wrought, \$20; Light or No. 2 Wrought, \$12; Rail Plates, \$18; Stove Plate, \$12; Machinery Cast, \$16 @ \$17; Cast Borings, \$10.50, Machine Turnings, \$13; Axle Turnings, \$15.50; Coal Steel, \$18; Leaf Steel, \$24; Locomotive Tires, \$20; Horseshoes, \$22; Axles, \$23 @ \$24.

Nails.—Inquiries are being received by manufacturers' agents, indicating a re-awakening in the demand, which had been checked by the decline in prices. A few sales of round lots have been made, but not many, as the manufacturers are not disposed to meet the prices now being made by the speculators and jobbers who are actively competing for the business in sight. During the week the jobbers reduced their regular quotations to \$2.50 for Iron and \$2.65 for Steel, with 10¢ off in carload lots, but these prices are shaded to good buyers.

Barb Wire.—While carload orders are few, the trade in small lots is very good. Prices are firm at 3.6¢ for Painted, and 4.35¢ for Galvanized, with 10¢ off for carloads, which the jobbers have adopted as a rate to be adhered to. The Secretary of the United Wire Company is now making a tour among the manufacturers for the purpose of effecting a final settlement of the pooling question.

Hardware.—Manufacturers' agents report a slight falling off in orders after the unusual activity in March, but not so great as might have been expected. Their business is still very good. The jobbing houses also report their business less pressing than it was two weeks ago. Their business with the far West has been seriously interfered with by the new freight rates. In Heavy Hardware, Wagon Stock, &c., the week was a very active one. The only change in prices reported is in Locks. The old price was 55¢ and 5¢ discount; it is now 55¢.

Lead.—The local market for Pig has been very quiet during the past week. Small lots have been sold at 4.25¢ @ 4.27½¢, large buyers being well supplied for the present.

Detroit.

CHARLES HINCHER & Co., dealers in Pig Iron, Detroit, Mich., report, under date of April 11, 1887, as follows: It was predicted that buying would commence during the early part of April or as soon as the Interstate Commerce law had really gone into effect and the tariffs of different roads were published. Though no large buying has as yet been done, there is considerable inquiry from nearly all sections for Pig Iron, and a few round lots have been booked at prices that vary but slightly from those existing during the past few months. It is thought that the demand for Lake Superior Charcoal will be in excess of other grades. We quote the market to day as follows:

Lake Superior Charcoal, All sizes	.....	\$19.00 @ \$20.00
Lake Superior Coke, All sizes	.....	20.00 @ 21.00
Lake Superior Coke, Under Mill	.....	22.00 @ 23.00
Standard Lake Blackband	.....	22.00 @ 23.00
Southern No. 1	.....	21.00 @ 22.00
Southern No. 2	.....	20.00 @ 21.00
Jackson County, Ohio	.....	20.00 @ 21.00
American Old Iron Rails	.....	20.00 @ 21.00
Old Wagon	.....	20.00 @ 21.00

APRIL 13, 1887.

Ammunition

[illegible]

\$100 | AMERICAN GIANT DYNAMO | \$100

Electro-Plating and Electrotyping Machines

IN ALL SIZES, FROM \$100 UPWARDS.



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ZUCKER & LEVETT CHEMICAL CO.,
ESTABLISHED 1863, INCORPORATED 1881,
SOLE MANUFACTURERS AND PATENTEES.

WORKS: 538 to 564 W. Sixteenth St, OFFICE: 36 to 40 Eleventh Ave., New York, U. S. A.

Trade Report.

General Hardware.

The market is generally referred to as less active than it has been, the falling off in trade being in good measure ascribed to the Interstate Commerce act and the uncertainty as to its interpretation and effect. In addition to this, it must be remembered that during the past few months a great many goods were purchased in anticipation of the wants of the trade, and many of these goods are still in the hands of the wholesale and retail houses. With the conviction that prevails that prices are not likely to go much higher in the near future, merchants are naturally indisposed to order beyond their present requirements. Stocks throughout the country, however, are not large, and, with the general prosperity and consequent large consumption of goods, it is expected that there will soon be an increased and satisfactory demand.

NAILS.

The underselling of the card rate, which has been going on for some time, led to a decline in the New York market during the current week, sales being made as low as \$2.25 for carload lots, the lower figures, however, leading to no increase in business. The pressure to sell is the outgrowth of the accumulation of stocks in the hands of some weaker makers, due to the dullness of the past months. The largest stocks of Nails of the year are usually carried by the mills and their agents at the opening of spring, and in that respect the situation is not, it is claimed, different from what it usually is. But thus far buyers have been holding off, and the burden has been too much for some of the weaker mills. Whether or not this condition of affairs is merely temporary depends upon circumstances. It is argued with some force that Nails are not unduly high—that in fact they have been the only leading article in the Iron trade which has not advanced to remunerative prices. It is urged that the disturbing effects of the Interstate Commerce law have told with no department of the trade as heavily as on Nails, acting upon the mills in two ways. Rates of freight have not alone been advanced on shipments of product from mill to market, but freights on Ore, Coal, Pig and other raw materials have been put up. In some cases this has gone so far that a number of mills have promptly decided to close down rather than meet higher costs on the one hand and lower markets on the other. Correcting influences are therefore at work even now. To-morrow a meeting of the Nail manufacturers is to be held in this city. It remains to be seen what action is to be taken. The wisest course would apparently be to agree to a restriction of product by closing down for two weeks at once.

The Chicago Nail trade is at present in a very unsatisfactory condition, owing to the action of manufacturers themselves, who unwisely made large sales at low prices about the beginning of winter. Some sales of accumulated stocks were made to parties not directly in the Nail trade, who bought on speculation, while other sales were made to jobbers, deliveries to extend far into the present year. Even the small jobbing trade was not overlooked, orders for unusually large quantities being placed with houses in the habit of buying conservatively. Under such circumstances the break in the price of Nails which has occurred is a natural and inevitable consequence. An extraordinary consumption of Nails would have averted the catastrophe, but there has been no extraordinary consumption during the winter and thus far in the spring, and with labor troubles in the building trades the outlook at present is not encouraging.

It is unfortunate for Western Nail manufacturers that the Chicago Nail trade is in this condition. This we believe to be largely due to the fact that it is not conducted on an independent basis. Articles of such universal consumption as Nails should have their price regulated solely by the supply and demand. A great Nail distributing center like Chicago should be kept as free from other influences as possible, on account of the moral effect produced on other markets by the tone of business there. Weak prices in Chicago are felt throughout a great section of the country, while firmness there speedily communicates its healthy influence in the same way and to as great an extent. The Nail manufacturing industry is one of the most important branches of the Iron and Steel trades of this country, being very widely distributed, and Chicago, as one of the most prominent centers of commercial activity in Nails, ought to be a pillar supporting that industry. This, however, is not the case. The influences governing the Nail trade of Chicago are mainly exerted in the direction of breaking prices, and therefore weakening the position of the manufacturers.

This is a grievance of long standing, but it can be corrected by Nail manufacturers if they are seriously disposed to apply the remedy. They should refrain from making large contracts with jobbers at low prices. Jobbers should be supplied with Nails in sufficient quantity to enable them to meet the requirements of their trade, but they should not be loaded down with

cheap stocks to be used as a vehicle in disposing of other goods. Those who purchase of jobbers have been educated to expect concessions on Nails when buying other goods in connection with them. Manufacturers have assisted in this education by giving jobbers the opportunity to use their Nails in this manner. They should adopt a different policy if they wish jobbers to maintain the trade in a reasonably healthy condition. When a Nail manufacturer is in need of money his stock of Nails should surely be good collateral on which to borrow for pressing necessities. It would be vastly better to raise money in that way than to force his Nails on jobbers at low prices, with full knowledge that some day he and his manufacturing colleagues will suffer from the reappearance of these Nails in active competition with theirs.

It would be better for the jobbing trade itself if manufacturers could and would act discreetly and with circumspection in this matter. If the price of Nails could be kept nearly uniform in the Chicago market, subject to the fluctuations caused by changes in supply and demand, a speculative element would be eliminated, and sales of Nails as well as of other goods would be made on a more legitimate basis. With uniform prices for Hardware, a buyer is now apt to go where he is offered the strongest inducement on Nails. Jobbers, therefore, endeavor by the use of every available business method to purchase Nails as cheaply as possible, in order to be in a position to meet competition in this line from other jobbers. Some of them are not so lucky as others in meeting manufacturers anxious to sell, or were not sufficiently shrewd to lay in large stocks when prices were very low, and they frequently find themselves at a disadvantage. Change this condition of affairs, put all jobbers on an even basis as nearly as can be done, and an important influence in the demoralization of their customers is destroyed. Manufacturers should not need many lessons of this kind to teach them what to do. If they are satisfied with the present condition of trade, or if they confess themselves helpless to correct it, the experience of the spring of 1886 will indefinitely repeat itself in the years to come. But if they will take to heart the real cause of the demoralization in the Chicago Nail trade, and determine to correct it, they may another season secure vastly better results, establishing their business on the solid basis which should characterize so important an industry.

BARB WIRE.

The market is quiet, as is usual at this season of the year, dealers having generally made their purchases, while consumers have not begun to buy. We quote, nominally, 4 3/4¢ for Four-Point Galvanized, in carload lots.

MISCELLANEOUS PRICES.

The Axe market, which has recently shown indications of irregularity, has within a week become seriously demoralized. There has been a break in prices, under which Axes are selling at nearly \$1 per dozen less than the extreme price agreed upon by the manufacturers, and there is a good deal of animated competition. This condition of things is much regretted, not only on account of its reducing the prices of Axes to unprofitable figures, which are, in fact, about as low as the goods were sold last year, but also on account of its effect on the market at large.

Most of the manufacturers of Augers and Bits are regarded as holding quite firmly to association prices, but there have recently been some instances of irregularities. The market is, however, regarded as in a fairly firm condition.

The prices of Bit Stock Drills have been gradually strengthening, and the goods are now sold at somewhat higher figures than heretofore.

There are some indications that higher prices on Stove Hollow-Ware will prevail before long, and the market is regarded as decidedly firm.

The manufacturers of Locks are issuing circulars announcing the advance of 5 per cent., to which we alluded in our last issue. The latest advices from the large jobbing centers indicate that the goods are still being sold at about the same prices as prevailed previous to the advance.

The manufacturers of Steel and Iron Squares have been in conference, but no announcement is made of any change in prices.

The following are the prices of the Peerless Sash Cords, put on the market by Travers Bros., 107 Duane street, New York:

	Cents per lb.
Peerless Italian Cable Laid Sash Cord.....	22
Peerless No. 7 Russia Sash Cord.....	20
Peerless Cable Laid India Sash Cord.....	17
Peerless No. 6 Patent Laid Sash Cord.....	15
Peerless No. 4 India Sash Cord.....	12
Peerless Braided India Sash Cord.....	20
Peerless Snow Thread Linen Sash Cord.....	25
Peerless Gray Linen Sash Cord.....	45
Peerless Cotton Laid Sash Cord.....	26

The following are their quotations on Hardware twines, a line which they expect in about a month to increase by the addition of an assortment of Chalk and Fish Lines:

	Cents per lb.
No. 12 Liberty Flax Twine.....	22
No. 18 and 24 Liberty Flax Twine.....	20
No. 30 and 48 Liberty Flax Twine.....	18
No. 12 D. C. Flax Twine.....	18
No. 18 and 24 D. C. Twine.....	16
No. 30 and 48 D. C. Twine.....	15
No. 44 D. C. Spring Twine.....	14
No. 6 D. C. Spring Twine.....	11
June Wrapping Twines.....	9

	Per doz.
Garden Lines, 50 feet.....	\$1.00
Garden Lines, 75 feet.....	1.25
Garden Lines, 100 feet.....	1.50

There has been no important change in the market for Tinware, circumstances not justifying the slight advance which it was hoped by the manufacturers it might be feasible to make before this. The associated manufacturers are maintaining prices firmly, but some outside goods are purchased at concessions.

The manufacturers of Table Cutlery have recently been in conference and have been devoting a good deal of attention to securing a uniformity in goods and prices. The condition of this line is unquestionably much more satisfactory than it has been for a long time, and with the withdrawal from the market, for one cause or another, of several concerns, there is, with the harmonious relations existing between the leading companies, and the understanding which has been reached among the associated manufacturers, a very hopeful outlook for the future. Prices which were recently advanced are firmly maintained, and still higher quotations made in some cases. It is thought not unlikely that still further advances will be made in the near future.

George Chase, 107th street and Harlem River, New York, makes the following net quotations on Oil Stones, &c.:

	Per pound.
Hindostan Stone, No. 1.....	\$0.03
Hindostan Axe Stone, assorted.....	.03 1/2
Hindostan Slips, No. 1.....	.02
Sand Stone.....	.17
Washita Stone, No. 1.....	.40
Extra Washita Red Stone, No. 1.....	.16
Arkansas Stone, No. 1, 4 to 6 inch.....	1.85
Turkey Stone, 4 to 8 inch.....	.40
Turkey Slips, assorted.....	1.00

The Penfield Block Company, Lockport, N. Y., for whom the H. B. Newhall Company, 105 Chambers street, New York, are agents, are putting on the market a new line of Hay Fork Pulleys, which are designated as Metaloid-Bushed Self Lubricating Hay Fork Pulleys. Their announcement concerning these goods will be observed on page 14. The following are the net prices at which they are offered:

	Per dozen.
Style H, Maple Sheave, Metaloid Bushed.....	\$2.50
Style L, Like Sheave, Metaloid Bushed.....	4.50
Style M, Iron Sheave, Patent Roller Bushed.....	6.25
Style O, Maple Sheave, Wood Bushed.....	3.00

We are advised by the company that Metaloid is a new lubricant which has not yet been introduced to the trade, but has been thoroughly tested in their factory and is warranted to do what is claimed for it. The company refer to it as exceptionally satisfactory, since it is comparatively inexpensive and at the same time possesses great wearing properties.

We are advised that at a special meeting of the Saddlery Hardware Manufacturers' Association, recently held at Syracuse, N. Y., a plan was agreed upon whereby manufacturers shall pay freight as far as the extreme point at which there are competing manufacturers, and charge for the goods the same price as such manufacturers. Beyond the outlying points of competition, which are referred to as Chicago on the west, Cincinnati and St. Louis on the south, and New Haven on the east, the buyer pays the freight. It is stated that this plan will be tried one month, and the question of its continuance be decided at another meeting.

Joseph Scheider & Co., 103-109 North Third street, Brooklyn, E. D., N. Y., quote the following prices on the goods named. It is intimated that special figures are made in large quantities:

	Watering Pots.
Quarts.....	1 2 3 4
With Common Tin Roses.....	\$1.40 1.20 2.10 2.30 3.00
Quarts.....	8 10 12 16
With Common Tin Roses.....	3.60 4.30 5.40 6.60
Quarts.....	1 2 3 4
With Patent Zinc Roses.....	\$1.80 2.20 2.50 2.70 3.50
Quarts.....	8 10 12 16
With Patent Zinc Roses.....	4.10 4.80 6.00 7.20

Galvanized Refrigerator Pans, 13 1/2 x 4..... \$2.25

The Implement and Vehicle Manufacturers' Association of St. Louis have been conferring with reference to the methods to be adopted for the regulation of prices. The competition in this line of business has been exceedingly animated, and prices have been brought down to a point at which they are referred to as unremunerative. In order to correct this condition of things the manufacturers are considering the advisability of forming a pool for the purpose of establishing a fair scale of prices, regulating the output of each factory, and preventing this extreme competition. It is stated that it is not intended to make a heavy advance on existing prices, the object being rather to give greater regularity and uniformity to the market.

ITEMS.

The proprietors of the Norway Tack Company, Wheeling, W. Va., and the Sandwich Tack Company, of Sandwich, Mass., have dissolved their co-partnership. This firm consisted of I. T. Jones, H. H. Heald, and T. W. Finney, who have been doing business together for more than 17 years. I. T. Jones and H. H. Heald have purchased Mr. Finney's interest in both establishments, and it is understood that they propose to continue the Norway Tack Company as a stock company, which will be organized for that purpose in a few days. Mr. Finney intends to continue in the Iron trade at Wheeling, and will represent some of the large manufacturers both in the Eastern and Western market.

The Goodell Company, Antrim, N. H., for whom the Alford & Berkelee Co., 77 Chambers street, New York, are special agents,

issue an illustrated and descriptive price list, dated March 1, 1887, in which they represent their line of Table Cutlery, Hunting, Butcher, Skinning, and other Knives. It is a very convenient pamphlet, giving cuts and list prices of the different goods. Among the new patterns are Solid Cocobolo Straight-Handled Butcher Knives, with and without bolsters. A new pattern Bread Knife, No. 441, and Table Knives and Forks, with patent stag swell handles bolstered and capped, scimeter blade.

Matthai, Ingram & Co., Baltimore, Md., issue a catalogue of summer goods, including Water Coolers, Refrigerators, Gas Stoves, and a considerable variety of miscellaneous specialties. It is accompanied by a discount sheet tearing date April 1. They also call attention to the fact that many of the list prices in their catalogue are void, and have been superseded by those given in their revised price list of January 20, 1887. The fact that their Fly Fan has been remodeled for the present season is alluded to, and a circular describing it is sent out.

The trade will observe the announcement made on page 10, by Doscher & Dixon, 88 Chambers street, New York, in which they refer to the lines of tools which they are handling as manufacturers' agents.

A. G. Spalding & Bros., Chicago and New York, issue an illustrated pamphlet devoted to Baseball supplies, athletic and sporting goods, &c. Of this line an extended variety is presented to the attention of the trade.

Willis C. Vajen, Indianapolis, Ind., has sold his Hardware business to Lilly & Stalnaker, who will carry it on at the same location as heretofore. In the circular announcing this change Mr. Vajen gracefully alludes to the transfer of interest as follows:

Allow me to acquaint you with the fact that I have sold my Hardware business. My record for the past 10 years has been surpassed by no one in a similar business, considering the amount of capital invested. I turn over to my successors the cleanest and most complete stock of Hardware, for the size, in the State. I have many to thank for the pleasing recollections of the past, and I bespeak for my successors, Messrs. Lilly & Stalnaker, the friendship, good-will and patronage which I have so long enjoyed.

The Hanika Iron Fence Company, Springfield, Ohio, issue a circular giving a description of their Hanika and Combination Lawn Mowers. It alludes to the special features of the machines, on the merits of which they lay emphasis.

The National Cash Register Company, Dayton, Ohio, issue a pamphlet which is devoted to an exhibition of the features and advantages of their Cash Register. The different Registers manufactured by the company are illustrated and described, and a large number of testimonials are given from houses in different parts of the country in regard to its utility. The matter thus presented to the trade is effectively displayed, and the pamphlet will doubtless result in still further emphasizing the advantages of the Register.

Schaeffer & Co., Dayton, Ohio, issue their annual catalogue and price list for the current year, in which are given descriptions of the Gem Steel Wire Rake and the Davis Lawn Rake.

The announcement of the A. F. Pike Mfg. Company, Pike Station, N. H., concerning their line of Scythe Stones, will be observed on page 37. The list of some of the leading brands will be of interest.

Rumsey & Company, Seneca Falls, N. Y., have issued a new catalogue and price list, comprising a very complete and extensive assortment of their leading Pumps and Fire Engines and other Hydraulic Machinery. An inspection of its pages shows that they make over 8,000 different styles and sizes of Pumps, both Brass and Iron; also Garden Engines, Hydraulic Rams, Steel Amalgam Balls, Cast Iron Sinks, Thimble Sinks, Corn Shellers, Cider, Cotton, Locomotive and Jack Screws, &c. In this catalogue they have added many new Pumps and other hydraulic machines. In their introductory circular they allude to their practical experience of 45 years in the production of these lines of goods, and the facilities which they possess for their manufacture. Their announcement concerning the catalogue will be observed among the Special Notices on page 17.

Reed & Prince, Worcester, Mass., announce, under date April 10, that they have secured the services of S. A. Haines, long and favorably known to the Hardware trade, 90 Chambers street, New York, to represent their goods. They also refer to the fact that they have recently increased their facilities for the manufacture of Rivets and Burrs, and use Norway Iron exclusively. They call special attention to the style of their package as commending itself to Hardware dealers and inviting inspection of contents without injury to package. Their label is large and plainly printed, the size and name of contents showing prominently. The firm have recently been adding to their line of goods, and are in position to fill orders promptly. They solicit orders either direct or through Mr. Haines.

The trade will observe the announcement on page 11 in which the Bagnall & Loud Block Company, Boston, Mass., illustrate their Star Brand Tackle Blocks, directing special attention to their Self-Adjusting Five-Roll Roller Bush Block, for the strength

and durability of which special claims are made. These Roller Bushed Blocks are referred to as giving twice the purchase of the Iron Bushed Blocks.

PROFIT-SHARING.

A recent issue of the *Missouri Republican*, St. Louis, Mo., contains an article on this subject by N. O. Nelson, which, referring to an important question which is receiving increasing attention, and giving as it does information which is not generally accessible, will be of interest:

The system of profit-sharing as distinguished from co-operation dates from 1842, when M. Leclaire, a Parisian house painter and decorator, announced to his journeymen that after paying interest on his capital the profits would be divided. The novel proposition was received with suspicion by his men and open charges of duplicity by socialistic leaders and journals. The first year's dividend of over \$2000 to 44 journeymen was materially increased the second year. Men saw that their work counted for their own profit, and that satisfaction to their patrons brought more business and more income. The house became famous and is so now. It was a veritable case of making two blades of grass grow where but one grew before. Leclaire lost nothing, but Leclaire's men were prosperous and independent. Up to 1885 \$850,000 had been paid the workmen in cash or life and accident insurance. Leclaire died in 1872, leaving a handsome fortune and a self-perpetuating profit-sharing corporation. His scheme had stood the test of two revolutions, four dynasties and many financial disturbances. The house has never passed a dividend. From 1870 to 1885 the cash dividends ranged from 12 to 23 per cent., besides full provision for casualty or death.

The Paris and Orleans Railway adopted profit-sharing in 1844 and continues it to the present day. Their original plan divided employees into three classes, viz.: Directors, heads of departments and subordinates. In the third year these classes received 56, 38 and 19 per cent., respectively as dividends on their salaries. It was found that fewer servants did the same work. There were less repairs to be made, and shareholders as well as employees far'd better. The deadly "branches" and "feuders," which Herbert Spencer described so vigorously 30 years ago in "Morals of Railway Management," made their inroads on even this excellent property, and dividends have declined. But in this instance, as in that of Leclaire, the improved efficiency has more than compensated for the dividends, which from 1842 to 1882 amounted to the sum of \$12,910,000. The dividends have gone as high as 40 per cent., and never below 9 per cent. The company employ over 17,000 men, and their circumstances are in no respect exceptional.

Many of your readers have shopped in the Bon Marche, in Paris. It is probably the greatest dry goods and furnishing emporium in the world. It employs 3000 clerks, has a capital of \$5,000,000 and its annual retail sales approximate \$20,000,000. Three-eighths of its profits goes to a preferred class of employees, about 200 in number. There is a provident society as a silent partner, comprising all employees having served the company five or more years. The dividends accruing to this society are reserved as an annuity, accident and life insurance fund.

In Delft, Holland, there is a distillery which began in 1874 to share its profits with its workmen. Starting upon the basis of cost in material and labor of the previous year a participation in any saving they effect is awarded the employees. In a history of this enterprise recently published by the manager, Van Marken, he states that 43 men now do the work which in 1878 required 78, and they earn 45 per cent. more wages. In addition to this direct premium they have a share in profits.

Probably the most conspicuous example is that of G. din, at Guise, France. G. din is himself a character. He possesses not only the self-made ability to conduct an extensive manufacturing plant, but he is a writer of no mean parts and a philanthropist of the broadest and most practical views. The little 20 x 30 one-story brick where he began the casting of Stoves 40 years ago still stands in the to acre inclosure, where nearly 1000 men now work on a permanent profit-sharing plan. Organization is carried to a completeness, yet there is as perfect freedom as can be found in any orderly establishment. The capital of the company is \$400,000, and its wages account is about \$115,000. The participation in profits began in 1877. The employees are classified according to length of service and qualifications. After paying the shareholders' interest on capital 25 per cent. of the remaining profits is paid to the Board of Management. Of this the president receives 12 per cent., nine directors 1 per cent. each, three supervisors 2 per cent. jointly, and 2 per cent. is distributed as special rewards for inventions and valuable services. The remaining 75 per cent. is divided upon wages and interest combined. There are three classes of workmen receiving respectively in the ratio of 1, 1 1/2 and 2 per cent. Promotions into higher classes are made by the management. The dividends are paid partly in cash and partly in stock certificates. In nine years the bonuses have amounted to about \$650 per man for the lowest class, and over \$2000 for the highest grade. In the meantime M. G. din has received an income from interest, salary and dividends largely exceeding usual manufacturing profits. He has had no strikes, has commanded the best talent and the very best work from every man. Indifferent workmen have been weeded out. Inventions and improvements have been stimulated by the premium fund.

"Beginning with January 1, this year, we propose to divide the profits made in our business upon the following basis: After allowing 7 per cent. interest on actual capital invested, the remainder will be divided equally upon the total amount of wages paid and capital employed. Our pay rolls for the year amount to about \$140,000, which will receive about one third of the net profits. Each employee will get his proportion according to the amount of wages paid him

Trade Report.

for the year. This will apply to persons who have served the company six months or over within the year, and who have not been discharged for good cause. Dividends will be paid in cash or may be left in the business to share in the profits, same as our own capital. They may select a man to examine the closing of our books at the end of the year."

The piano house of M. Bord, Paris, adopted profit sharing in 1865, and the dividends to labor have steadily increased from 9 per cent. in 1865 to 10 per cent. in 1885. It has never failed to pay a liberal dividend except in the one year of German invasion. The General Assurance Company of Paris, employing about 250 clerks and agents, have for 37 years past set aside 5 per cent. of their profits as an annuity and life insurance fund for their employees. Strictly profit sharing concerns are numerous in France, and more or less of them are found throughout Europe, but shareholding in corporations is the more common method. In many English mills a majority of the workmen own shares, which constitute their basis in the profits.

In the United States attention has only recently been directed to this subject by the alarming differences arising between employers and their men. In 1879 the extensive woolen mills of the Hazards, at Peace Dale, R. I., adopted profit-sharing, and have paid 3 to 5 per cent. dividends on wages. Since 1882 the Pillsbury, of Minneapolis, owning the largest flour mills and elevators in the world, have operated upon a profit sharing basis, the dividends amounting in three years to \$81,000. The company regard it of direct benefit to themselves, as well as just to their men. The Page Belting Company, of New Hampshire, F. P. Allis & Co. and Hoffman & Bilings Mfg. Company, of Milwaukee, and many other concerns, have adopted the plan within the last twelve months. At the beginning of the present year a manufacturing company in this city, employing about 250 men, issued the following notice to their employees:

It will be observed that no change in management or ownership or wages is involved. Business proceeds without interruption. It assumes without argument that men will be more efficient when their own interest is at stake. It imposes no conditions and loads its proposition down with no superfluous flourish or sentimentality. If the proprietor has any philanthropic purpose it is incidental and not ostensible. It is a proposition which may be approved and adopted upon the very practical grounds of profit, security and equity. I lay emphasis upon the fact that this plan is equally applicable to every variety of productive or commercial occupation, and upon the highest as well as the lowest employee. In the examples I have described I have purposely selected from every class and extent of business, specialized and random, daywork and piecework, in factories and outdoors. It is undoubtedly true that a journeyman of the house-building trades could utilize his time much better if working for himself than he now does when his wages are fixed and only remotely contingent on his efficiency. It is also true that railroad managers would have less inducement to wreck the property in trust to them. They might, indeed, under such a system give less attention to the bribery of legislators and the subjugation of employees and more to the legitimate business of transportation and profits.

Metal Market.

Copper.—The market has been very dull during the holidays, and business has been interfered with. Offerings continue for Lake Ingot, for April and May delivery, at 10 40¢, some 50,000 lb. April delivery having been parted with at 10 35¢, but this, perhaps, is only obtainable now for more distant deliveries, say, June, July, August and September, sellers asking 10 45¢, but might shade that figure. The feeling is for lower prices. Orford and Baltimore can be bought on the spot and for April delivery at 9 30¢, and probably at 9 25¢. Chili Bars are cabled from London on the 7th, 8th and 12th inst. £39 7/6, while this morning they are 5/ higher, Best Selected remaining £44 10/.

According to Messrs. James Lewis & Son's Liverpool monthly review for April 1 the import of American Copper during the first quarter of the year has been 601 tons, Fine, against 342 1/2 last year and 491 1/2 in 1885. Messrs. Henry R. Merton & Co., London, make the visible supply of Copper in England and France on April 1, 57,023 tons, against 58,499 tons on April 1, 1886, the price of bars being £39 10/ against £41 10/ the year before. The deliveries in England and France, according to the same authority, from the 31st April, 1886, to the 1st April, 1887, have been 83,248 tons, Fine, against 102,211 the previous year, and 103,350 in 1885.

Tin.—The holidays and the absence of London quotations since Thursday have more or less interfered with the business here. On Monday last the business recommenced, and 75 tons for June delivery were forced off at 22 55¢, but since Tuesday, when we received from London news of a further drop of 7 6¢ ton, April Tin has been sold at 22 45¢. For May, not over 22 40¢ has been bid, and for June, 22 50¢. July has been sold largely from 22 55¢ to 22 1/2¢. Yesterday's cable from London brings a further drop of 10/ on spot, and 12/6 on futures, and there is every probability of our market being obliged to follow their reactionary movement. Dealers here are disposed to hold spot Tin and near deliveries at last quotations, but the break in the East, and in London will probably have the effect of considerably reducing the value of futures, which are

now being sold without the exorbitant premium which has been paid during the past six months by operators for an advance. The London quotation as cabled this morning is £100. 15/ for spot Straits and £101. 5/ for three months. Tin Plates.—Arrivals have been moderate and have been taken off the market, so that our stock is very light at present. Coke Tin continues in good request and very strong. We quote at the close Siemens Martin Steel, large lines, per box: Charcoal finish, \$4.75 @ \$5.25; Coke finish, \$4.60; Charcoal Ternes, \$4.15 @ \$4.25, and Coke Tins, \$4.25 @ \$4.35. At Liverpool there are a good many inquiries, but not leading to a great deal of business. The quotation on Coke Tins at that point remains 13/.

Lead.—The sales for the week sum up 400 tons Common Domestic, the bulk at 4 30¢, with a few jobbing lots at 4 32 1/2¢. The market remains very quiet, closing at 4 30¢ for Common Domestic and 4 35¢ @ 4 40¢ for Refined. The Western markets have declined materially, St. Louis quoting at 4¢ @ 4.05¢, and Chicago, 4 05¢ @ 4 10¢. In the London market there has been no further change, Soft Spanish remaining £12. 10/ and English Pig £12. 15/.

Spelter and Zinc.—The market for Common Domestic Spelter on the spot has been altogether featureless, the spring demand not yet reviving, so that we have to maintain our previous quotation of nominally 4.40¢ @ 4.60¢. Silesian meanwhile being bought at 4.80¢ @ 4.85¢ nominally, remaining unaltered in London at 14/.

We quote Bertha Refined 8¢. Sheet Zinc.—The chief maker having shut down for repairs, there is a momentary scarcity in the market, and Domestic is being dealt in to a moderate extent only at 4 75¢ @ 4 95¢.

Antimony.—There has been a jobbing business merely, the market remaining steady at 9¢ for Cookson and 7 75¢ for Hallet, the latter remaining £29. 10/ in London.

New York Metal Exchange.

The following sales are reported:

THURSDAY, April 7.	
25 tons Tin, May	22.50¢
10 tons Tin, Spot	22.47 1/2¢
10 tons Tin, June	22.50¢
25 tons Tin, June	22.50¢
10 tons Tin, July	22.50¢
10 tons Tin, May	22.50¢
10 tons Tin, June	22.50¢
MONDAY, April 11.	
75 tons Tin, June	22.55¢
TUESDAY, April 12.	
30 tons Tin, April	22.45¢
10 tons Tin, July	22.50¢
40 tons Tin, June	22.50¢
25 tons Tin, July	22.50¢

Old Metals, Rags, &c.

The purchasing prices offered by dealers are as follows:

Heavy Copper	..... @ \$0.07
Light Copper	..... @ .06
Copper Bottoms	..... @ .06
Brass, Heavy	..... @ .06
Brass, Light	..... @ .04
Composition	..... @ .08 1/2
Lead, Heavy	..... @ \$0.03 1/2
Lead, Light	..... @ .03
Zinc	..... @ .03 1/2
Wrought Iron	..... @ 23.00
Light Iron	..... @ 22.00
Stove Plate Iron	..... @ 22.00
Machinery Iron	..... @ 16.00
Grate Bars	..... @ 7.00
Old Rubber	..... @ .05
White No. 1	..... @ .03 1/2
White No. 2	..... @ .03 1/2
Canvas, Linen, No. 1	..... @ .04 1/2
Canvas, Cotton, No. 1	..... @ .04 1/2
Canvas, No. 2	..... @ .02 1/2
Second	..... @ .01
Woolens	..... @ .07
Fixed Rags	..... @ .01
Junny Bagging, No. 1	..... @ 9.16 @ 11.16
Butt	..... @ 9.16 @ 11.16
Book Stock	..... @ .01 1/2
Newspapers	..... @ .00 1/2
Waste Paper	..... @ .00 1/2
Kentucky Bagging	..... @ .02 1/2
Kentucky Bale Rope	..... @ .04
Kentucky Bagging	..... @ .02 1/2

Coal Market.

The Coal trade is comparatively quiet, as buyers and sellers alike are not disposed to enter into long engagements, and prices are hardly as firm. Wholesale dealers, however, so far as can be learned, are making no concessions from the latest circulars. Upon this point the Philadelphia Ledger says: "The loss resulting from any deviation from the circular figures made by an individual operator to force the sale of stock Coal or to prevent an accumulation must be borne entirely by himself, as the railroads now exact the full schedule rate of tolls irrespective of the price at which Coal may be sold." There is a continued good demand for the Steam sizes, Chestnut and Pea, at full prices. The production at the mines shows a slight increase compared with the corresponding week last year. Since January 1 the total is 8,163,711 tons, as against 7,868,912 tons for the same period last year; increase, 294,799 tons. At Port Richmond the stock of Anthracite is reported to be 140,000 tons, but the accumulation at shipping points generally is moderate. Canal navigation is now opened, and the through rate to New York harbor via the Delaware and Raritan is \$2 1/2 ton. Current quotations for Free-Burning White Ash at New York ports are: Broken, \$3.55; Egg, \$3.80; Stove, \$4.15; Chestnut, \$4; Pea, \$3; Reading Hard White Ash, Broken and Chestnut, \$3.85; Pea, \$2.75.

Representatives of the Seaboard Soft Coal Association claim to be doing a good business at full prices, and a further advance May 1 is spoken of as possible. Shipments from the Cumberland region for the week were 66,810 tons, and for the year to date 752,159 tons, an increase of 380,849 tons

compared with the corresponding period of last year. Quotations are \$3.50 alongside in New York; \$2.60 f.o.b. at Baltimore and Philadelphia. Operators figure up an increased cost of 10¢ 3/4 ton compared with last year, in addition to larger freight charges.

Respecting the agreement between the Pennsylvania Railroad and the Reading Company the Philadelphia Record says: "Last year's contribution of 800,000 tons from the Beach Creek Railroad to the Reading lines will be increased this year by 100,000 tons, while Reading will also be laid red with 500,000 tons from the Clearfield region, a clear gain of 600,000 tons. The Pennsylvania Railroad has also opened all of its lines to the West to the Reading Railroad Company for the shipment of Anthracite Coal in that direction."

Louisville.

LOUISVILLE, KY., April 11, 1887.

There have been a number of sales the past week in this market of Pig Iron, in lots ranging from 100 to 700 or 800 tons. Buyers seem willing to place their orders if rates can be secured to them, but few furnaces show a disposition to guarantee rates as quoted—in fact, it is difficult to get railroads to name any rates. On account of this, business remains in the same unsatisfactory state, as far as sales for delivery in territory north of the Ohio River are concerned. We hear of no accumulation of stocks, and furnaces have as much as they can attend to fill orders booked; many of them are behind on shipments. The consumption continues very large. There is some demand for Old Car Wheels, with the supply quite light. We quote as below:

Pig Iron.	
Southern Coke, No. 1 Foundry	..... \$21.50 @ \$22.00
" " " " " "	..... 20.50 @ 21.00
" " " " " "	..... 20.00 @ 20.50
Hanging Rock Coke, No. 1 Foundry	..... 21.00 @ 21.50
Southern Charcoal, No. 1 Foundry	..... 22.00 @ 23.00
Silver Gray, different grades	..... 20.00 @ 20.50
Southern Coke, No. 1 Mill, Neutral	..... 19.50 @ 20.00
" " " " " "	..... 19.00 @ 19.50
" " " " " "	..... 18.50 @ 19.00
White and Mottled different grades	..... 17.50 @ 18.50
Southern Car Wheel, standard brands	..... 25.00 @ 27.00
" " " " " "	..... 24.00 @ 25.00
Hanging Rock, Cold-Blast	..... 27.00 @ 28.00
" " " " " "	..... 23.00 @ 24.00

W. B. BELKNAP & Co., Louisville, report as follows, under date of April 11: The week just passed has been comparatively uneventful. The revolution expected to be worked by the Interstate Commerce bill failed to materialize, inasmuch as the commissioners very considerably granted the request of Southern railroads represented mainly by M. H. Smith, vice-president of the Louisville and Nashville, to permit the present status as to long and short hauls to remain unchanged for the next 60 or 90 days. This privilege of course cannot be extended to one part of the country and denied another, and it seems now extremely doubtful when, if ever, the full provisions of the law will take effect. Trade has kept up in fair volume, but manufacturers are pressing their product more persistently than heretofore, which would indicate that in many lines they are not crowded with orders.

Bar Iron.—This is about the stiffest article on the list. There has been no concession made on bar sizes, nor does there promise to be immediately. The demand is fair, and this, coupled with old contracts, will keep makers busy for some little while.

Sheet Iron.—Is easy to secure for prompt shipment, but prices firmly upheld.

Nails.—Are jibbing in moderate quantities. No large lots are being taken, as there are no speculation in them, and the contest between jobbers selling old stocks and manufacturers trying to run in new is quite active. Wire Nails are commanding more attention in this market than heretofore. Sales are constantly increasing.

Wire.—Barb Wire is very firm, and selling freely; while the Barb Wire makers contend that Plain Wire is very firm, and it certainly is in good demand, still the mills are freer sellers than they were a short time back, and we doubt if any higher prices on this are likely to prevail.

The failure of the Axe combination and the recent break in Strap and Tee Hinges are unfortunate at this time, and have gone far to shake confidence in many other lines, however remotely connected with them.

The Technologist, says the American Architect, describes a simple method of treating wood with preservative solutions, which is applied in Norway to telegraph poles. After the poles are set in place, a man goes from one to another with an auger, with which he bores a hole in each post, beginning at a point about 2 feet above the ground, and boring obliquely downward, at an angle as small as possible, with the axis of the post, until the point of the auger reaches the center of the stick. The auger-hole should be an inch in diameter, and, in telegraph poles of the ordinary size, will hold easily 4 or 5 ounces of sulphate of copper, which is put into it in the form of coarsely powdered crystals, and the opening then stopped with a plug, the end of which is left projecting as a handle. Just what action it may be that then goes on in the interior of the stick, no one pretends to say; but it is found that the crystals of copper sulphate disappear slowly, so that every three or four months the charge must be renewed; while the wood, both above and below the auger-hole, even to the very top of the pole, gradually assumes the greenish tint due to the presence of copper in the pores.

The bill to regulate the transportation and storage of petroleum by means of pipe lines and tanks, to limit the charges therefor, to regulate deductions for sediment, water, shrinkage and other losses, and imposing penalties for violations of the same, known as the Billingsley bill, passed the Pennsylvania House on Tuesday.

Imports.

The following were the Imports of Hardware, Iron, Steel and Metals into the Port of New York for the week ending April 12, 1887:

Hardware.		Sacks & Richmond.	
Atlas S. S. Co.	Kege nails, 60	Malleable castings,	Kcs, 4
Cases, 2		Stetson, Geo. W. & Co.	Pig tons, 200
Baker, Hermann & Co.	Cask, 1	Ward, Jas. E. & Co.	Old rails, pos, 17,019
Arms, es, 20		Scraps, tons, 1008	Old rails, pos, 17,019
Barbour Bros. & Co.	Mach'y, es, 60	Williamson, Jas. & Co.	Pig tons, 200
Mach'y, es, 60		Wright, Peter & Co.	Cask, 1
Burkshaw, W. C.	Cases, 2	Order	
Brown, G. & Co.	Mach'y, pkgs, es, 28	Old rails, tons, 874	Rings, 112
Crossman, W. H. & Bro	Mach'y, pos, 5	Old rails, pos, 17,019	Old rails, pos, 17,019
Crandall & Godley,	Machinery, es, 2	Old rails, pos, 17,019	Old rails, pos, 17,019
Curry, J. & Bro,	Mach'y, es, 3	Wire rods, coils, 15,332	Old d-shingles, tons, 20
Dealey, Robert & Co.	Mach'y, case, 1	Pipes 210	
Ely & Wray,	Cask, 1	Flat bars, 9	
Field, Alfred & Co.	Mach'y, es, 14	Pig tons, 300	Spiegel, tons, 160
Chas. cks, 24		Snoots, 250	Old rails, 9,329
First Nat. Bk. Chicago,	Mach'y, case, 1	Bess, pig tons, 445	Rods, bbls, 600
Mach'y, case, 1	Fly-wheel, case, 1	Scraps, tons, 44	
Foley, Ed.	Cases, 2	Abbot, Ezer & Co.	Pigs, 20
Folsom, H. & D.	Arms, es, 7	Wire goods, coils,	15,427
Gerdan, Otto,	Mach'y, es, 244	Cases, 35	
Gard, C. & Co.	Mach'y, es, 1	Belcher & Parke,	Cask, 1
Cases, 11		Baker, Carl F.	Bars, 5
Gurney, B. B.	Cases, 4	Bills, 1	Cases, 7
Half, A. H.	Cases, 2	Bills, 85	Dodge, Alfred,
Hartley & Graham,	Arms, es, 6	Pigs, es, 4	Downing, R. F. & Co.
Johnson, John,	Mach'y, pos, 19	Plates, 756	Bundles, 51
Mach'y, pkgs, 1	Kas. of A.	Goodwin, R. C. & Co.	Wire plates, cks, 7
Mach'y, pkgs, 1	Mach'y, es, 3	Mayer, Strauss & Co	Cask, 1
Koehler & Schmitt,	Cutlery, es, 5	Merch. Dispatch Co.	Bills, 51
Lau, J. H. & Co.	Arms, es, 6	Mine, A. & Co.	Sheets, 100
Lyden, J.	Mach'y, es, 3	Morton, Bliss & Co.	Sheets, 145
Cask, 1		Naylor & Co.	Blooms, 2333
McIntosh & Sanders,	Mach'y, es, 24	Rods, bbls, 9000	Bars, 250
Merch. Disp. Co.	Guns, es, 9	Bills, es, 600	Newton & Shipman,
Mach'y, es, 7	Mach'y, es, 1	white plate blanks,	181
Mot's Sons, J. P.	Arms, case, 1	Pigs, 50	Wagon, W. F.
Mach'y, es, 3	Books cks, 4	Bills, 250	Bars, 5
Newton & Shipman,	File nails, kegs, 39	Cas-es, 5	Plates, 51
Files cks, 4		Pigs, 357	Webb, J. Beers,
Rathor's Sons,	Hook nails, kegs, 39	Cast steel furnaces,	Order
Rotterdam S. S. Co.	Arms, es, 2	Straps, cks, 35	Bills, 120
Schroverling,	Mach'y, es, 17	Bars, 86	Bands, 197
Schutte Wm. & Co.	Mach'y, es, 17	Reifers 17	Old rails, pos, 7314
Mach'y, es, 17		Old rails, tons, 378	Rails, 5000
Taylor, Tros.	Cases, 4	Tires, 54	Cakes of steel, lot, 1
Ward, Aseline,	Cutlery, es, 2	Old spring, tons, 60	Tubes, 10
Wiebusch & Hiker,	Mach'y, es, 17	Hoops, bbls, 6300	Pigs, 42
Wiebusch & Hiker,	Mach'y, es, 17	Straps, 9	
Wheeler, T. S.	Mach'y, pkgs, 34		
Mach'y, pkgs, 49			
Mach'y, es, 7			
Bags, 50			
Iron.		Metals.	
Abbot Ezer & Co.	Spiegel tons, 191	American Metal Co.	Tin, pkgs, 185
Baring Bros. & Co.	Wire rods, coils, 2167	Bank British N. Am.	Plumbar, 1 case, 752
Nail rods, coils, 255		Tin plates, bxs, 701	Canadian (Can. Iron)
Iron, 200		Tin plates, bxs, 900	Gouge, 1
Bills, 208		Brass foundry, cask, 1	Phelps, Dodge & Co.
Ore, tons, 20		Phosph. foundry, es, 8	Hechler & Co.
Brown Bros. & Co.	Old iron, tons, 350	Plumbago, bbls, 820	Lewis & Conger,
Old iron, tons, 350		Tinware, bbls, 2	Montef, F. T. & Co.
Broecker & Evans,	Wire netting, coils, 659	Copper, bbl, 1	Yellow metal, bbls, 15
Wire netting, coils, 659			
Codding & Co.	Bills, 757		
Carey & Moen,	Rods, bbls, 580		
Crocker Bros.	Mach'y, pkgs, 190		
Mach'y, pkgs, 190			
Manganese, es, 27			
Ferromanganese, es, 74			
Spiegel tons, 73			
Day	Sheets, bbls, 248		
Downing R. F. & Co.	Girders, 326		
Lumber, Gust.			
Mach'y, rods, coils, 267			
Lee, Jas. & Co.	Plz. tons, 20		
Mason, John W.	Wire rope, coils, 3		
Milne, Wm. & Co.	Bills, 80		
Bars, 106			
Morton, Bliss & Co.	Bridge plates, 107		
Naylor & Co.	Rods, coils, 1365		
Spiegel tons, 1365			
Nail rods, pos, 1365			
Bess, pig tons, 900			

WHOLESALE METAL PRICES, APRIL 13, 1887.

METALS.

IRON.—Duty: Bars, 8-10¢ to 11-10¢; provided that no bar shall pay a less rate of duty than 8¢. Sheet, 11¢ to 13-10¢; Band, Hoop and Scrolled, 14¢ to 15-10¢; Railroad Bars weighing more than 25 lb per yard, 7-10¢ of 1¢ per lb.

Standard American Pig Iron.

Foundry No. 1 X..... ton \$21.00 @ 21.50
Foundry No. 2 X..... ton 20.00 @ 20.50
Gray Forge..... ton 18.50 @ 19.00

No. 1 Scotch Pig Iron.

Carnegie..... ton \$21.50 @ 22.75
Cottrell..... ton 22.50 @ 23.00
Shotts..... ton 22.25 @ 22.50
Glenbrook..... ton 22.00 @ 22.50
Gartsbrie..... ton 22.25 @ 22.50
Langdon..... ton 22.50 @ 23.75
Summerlee..... ton 22.00 @ 22.50
Dunellington..... ton 21.75 @ 22.00
Eginton..... ton 20.50 @ 21.00
Clyde..... ton 20.50 @ 20.75

Rails.

Steel, at Eastern mills..... ton \$39.00 @ 40.00
Old Rails, Ts..... ton 22.50 @ 23.00

Scrap.

Wrought, ton, from yard..... \$24.00 @ 24.50

Bar Iron from Store.

1/2 to 2 in. round and square..... \$ 2.30 @ 2.30¢

1 to 6 in. x 1/2 to 1 in..... \$ 2.40 @ 2.60¢

1 to 6 in. x 1/2 and 5-16..... \$ 2.60 @ 2.80¢

Rods, 1/2 and 1-1/2 round and sq..... \$ 2.30 @ 2.70¢

Rails—1 to 6 in. to No. 12..... \$ 2.50 @ 2.70¢

Burden's Best "Iron, base price..... \$ 2.50 @ 2.70¢

Burden's "H. B. & S." Iron, base price..... \$ 3.00 @ 3.00¢

Norway Rods..... \$ 5.00 @ 5.00¢

Sheet Iron from Store.

Common American..... R. G. Cleaned.

Nos. 10 to 16..... \$ 2.50 @ 3.00¢

17 to 20..... \$ 2.80 @ 3.00¢

21 to 24..... \$ 3.00 @ 3.00¢

25 and 26..... \$ 3.25 @ 3.00¢

27..... \$ 3.50 @ 3.00¢

28..... \$ 3.75 @ 3.00¢

Galvanized 16 to 20..... \$ 4.00 @ 4.10¢

Galvanized 1 to 24..... \$ 5.30 @ 4.10¢

Galvanized 25 to 26..... \$ 5.50 @ 4.10¢

Galvanized 27..... \$ 6.00 @ 4.10¢

Galvanized 28..... \$ 6.50 @ 4.10¢

American Russia..... \$ 10¢ @ 10¢

Russia..... \$ 10¢ @ 10¢

American Cold Rolled B. H..... \$ 7¢ @ 7¢

Iron Wire. (See Wire.)

STEEL.—Duty: Ingots, Bars, Sheets, &c., valued at 4¢ per lb. or less, 45¢ ad. val.; valued above 4¢ and not above 7¢, 25¢ ad. val.; valued above 7¢ and not above 10¢, 35¢ ad. val.; valued above 10¢, 45¢ ad. val. Extra—Steel Bars, Rods, &c., cold hammered or polished, any way in addition to ordinary hot rolling, 1 1/2¢ in addition to above; Steel Circular Saw Plates, 1¢ in addition to the above.

American Cast Steel.

For American Steel, see Pittsburgh quotations.

Chrome Steel.

Tool Steel, ordinary sizes, 3/4 to 3 inches, net..... 10 @ 14¢

Adamantine Shoes and Dies..... 8 @ 14¢

Magnet Steel..... 14 @ 14¢

English Steel.

Best Cast..... \$ 14 1/2 @ 15¢

Extra Cast..... \$ 15 @ 15¢

Circular Saw Plates..... \$ 14 @ 15¢

Swaged Cast..... \$ 16 @ 15¢

Best Double Shear..... \$ 18 @ 15¢

Blister, cut quality..... \$ 18 @ 15¢

German Steel, Best..... \$ 18 @ 15¢

2d quality..... \$ 18 @ 15¢

3d quality..... \$ 18 @ 15¢

Sheet Cast Steel, 1st quality..... \$ 14 @ 15¢

2d quality..... \$ 14 @ 15¢

3d quality..... \$ 14 @ 15¢

Tin.

Duty: Plates, Sheets, Tagger and Terne, 1¢ per lb.; Bars, Block and Flats free.

Banca..... \$ 23 1/2 @ 24¢

Strait..... \$ 23 1/2 @ 24¢

English..... \$ 23 1/2 @ 24¢

Star..... \$ 23 1/2 @ 24¢

Charcoal Tin Plates.

1 C 10x14 25 sheets..... \$ 5.00 @ 6.87 1/2

C 12x12 25 sheets..... \$ 5.00 @ 6.87 1/2

C 20x28 112..... \$ 10.45 @ 14.75

X 10x14 25 sheets..... \$ 6.00 @ 9.37 1/2

X 12x12 25 sheets..... \$ 6.00 @ 9.37 1/2

D C 12x12 100..... \$ 5.00 @ 5.75

D X 12x12 100..... \$ 6.00 @ 7.25

For each additional X add..... \$ 1.25 @ 2.25

Coke Tin Plates.

Best..... \$ 4.50 @ 4.75

Ordinary..... \$ 4.75 @ 4.65

C 10x14..... \$ 4.75 @ 4.65

C 12x12..... \$ 4.75 @ 4.65

C 20x28 112 sheets..... \$ 9.00 @ 1.50

Terne Plates.

Prime Char. 2d quality..... \$ 13.25

1 C 14x20 M.F. \$6.50..... \$ 6.50

1 C 14x20 Old Process..... \$ 13.25

1 C 20x28..... \$ 13.25

1 C 14x20..... \$ 4.50 @ 4.75

1 X 14x20..... \$ 5.75 @ 6.00

1 C 20x28..... \$ 7.75 @ 8.50

1 X 20x28..... \$ 11.00 @ 12.00

Tin Boiler Plates.

1XX 14x20, 2 sheets for No. 7, 112 sheets..... \$ 12.00

1XX 14x20, 2..... \$ 13.00

1XX 14x20, 2..... \$ 15.00

12 and 11 oz. per square foot..... \$ 21¢

10 and 11 oz. per square foot..... \$ 21¢

TINNING.

Sheets, one side, 10, 12 and 14 x 48..... each, 8¢

Sheets, one side, other sizes..... square foot 2 1/2¢

For tinning both sides, double the above prices.

For tinning boiler sizes, 8 in., 14 x 56..... each, 15¢

For tinning boiler sizes, 7 in., 14 x 56..... each, 15¢

Sheathing (copper, 14 x 18).

Hot Cold..... \$ 18¢

16 oz. to sq. ft. and heavier, per lb..... 18¢

14 oz. and up to 16 oz., per lb..... 18¢

12 oz. and up to 14 oz., per lb..... 20¢

Tinning, 6 cents each.

Copper Bottoms.

Pls and Plats, 14 oz..... \$ 21¢

Pls and Plats, 12 oz..... \$ 21¢

O'Neill's Patent Planished Copper, Net.

14 and 16 oz. and heavier..... By the case, \$ 20¢

12 oz. and lighter..... \$ 20¢

Boiler Sizes.

7 in., 14x56, 8 in., 14x56, 9 in., 14x60, and 16 oz. and heavier, 5¢ By the case, \$ 20¢

And all sizes not over 20 ft wide.

24x48 and 30x60..... \$ 21¢

and 16 oz. and heavier..... \$ 21¢

Planished Brass same price as Planished Copper

Copper Wire. (See Wire.)

Yellow Sheathing Metal, \$ 18¢ @

BRASS AND GERMAN SILVER.

reem & Sharpe's Gauge the Standard for Metal; Old English Gauge the Standard for Wire. Common, \$ 100 @

LEAD.—Duty: Pig, \$2.50 100 lb; Old Lead, 3¢ per lb; Pipe and Sheet, 3¢ per lb.

Pig..... 14¢ @ 47¢

Bar..... 14¢ @ 47¢

Pipe..... 14¢ @ 47¢

Sheet..... 14¢ @ 47¢

Shot, 7 bag, 25 lb..... Drop, \$1.40; Buck, \$1.05

Chilled Shot, 7 bag, 25 lb..... \$1.05

ANTIMONY.

Raillet..... \$ 4 @ 9¢

Cookson..... \$ 9 1/2 @ 10¢

SPELTER.—Duty: Pigs, Bars and Plates, \$1.50 100 lbs.

American, cash..... 45¢ @ 5¢

Bergerport..... 45¢ @ 5¢

600 lb casks..... 57¢ @ 6¢

Zinc—Open..... 6¢ @ 6¢

Zinc Tubing..... dis. 10 @ 25¢

Zinc Tubing—Dis. 25¢.

Plain..... 27

Fancy..... 38

Scotch and Extra Patterns..... 38

RABBIT METAL.

N. P. U..... \$ 6 1/2 @ 7¢

X..... 10¢

X..... 10¢

J. H..... 30¢

WIRE.

Market Wire.—Put up in 63 lb bundles.

Nos. 10 to 9..... 10, 11, 12, 13, 14, 15, 16, 17, 18.

10..... 11 1/2 @ 12 1/2

11..... 12 1/2 @ 13 1/2

12..... 13 1/2 @ 14 1/2

13..... 14 1/2 @ 15 1/2

14..... 15 1/2 @ 16 1/2

15..... 16 1/2 @ 17 1/2

16..... 17 1/2 @ 18 1/2

17..... 18 1/2 @ 19 1/2

18..... 19 1/2 @ 20 1/2

Bright Market Wire..... dis. 67 1/2¢

Charcoal..... dis. 47 1/2¢

Bale Wire, Nos. 7 to 12..... dis. 62 1/2¢

Annealed Market Wire..... dis. 67 1/2¢

Fence Wire, Nos. 8 and 9..... dis. 67 1/2¢

Grape Wire, Nos. 10 to 14..... dis. 62 1/2¢

Coppered Market Wire..... dis. 62 1/2¢

Galvanized Market Wire..... dis. 57 1/2¢

Fence Wire..... dis. 57 1/2¢

Stone or Weaving Wire.

Nos. 16 17 18 19 20 21 22 23 24 25 26

Centes..... 14 15 16 17 18 19 20 21 22 23 24 25 26

Nos. 27 28 29 30 31 32 33 34 35 36 37 38 39

Centes..... 28 29 30 31 32 33 34 35 36 37 38 39 40

Nos. 16 to 18..... dis. 67 1/2¢ @ 70 1/2¢

19 to 26..... dis. 67 1/2¢ @ 70 1/2¢

27 to 36..... dis. 72 1/2¢ @ 75 1/2¢

Galvanized Stone Wire..... dis. 50 1/2¢

Steel Wire.

Cast Steel, Steel Wire list..... dis. 50 1/2¢

Brass and Copper Wire.

Old English Gauge the Standard—Dis. 20 @ 25.

Common High Low Bronze Copper.

All Nos. to No. 15..... \$ 0.32 @ \$ 0.30

No. 17 and 18..... \$ 0.32 @ \$ 0.31

" 19 and 20..... \$ 0.32 @ \$ 0.31

" 21..... \$ 0.32 @ \$ 0.31

" 22..... \$ 0.32 @ \$ 0.31

" 23..... \$ 0.32 @ \$ 0.31

" 24..... \$ 0.32 @ \$ 0.31

" 25..... \$ 0.32 @ \$ 0.31

" 26..... \$ 0.32 @ \$ 0.31

" 27..... \$ 0.32 @ \$ 0.31

" 28..... \$ 0.32 @ \$ 0.31

" 29..... \$ 0.32 @ \$ 0.31

" 30..... \$ 0.32 @ \$ 0.31

" 31..... \$ 0.32 @ \$ 0.31

" 32..... \$ 0.32 @ \$ 0.31

" 33..... \$ 0.32 @ \$ 0.31

" 34..... \$ 0.32 @ \$ 0.31

" 35..... \$ 0.32 @ \$ 0.31

" 36..... \$ 0.32 @ \$ 0.31

" 37..... \$ 0.32 @ \$ 0.31

" 38..... \$ 0.32 @ \$ 0.31

" 39..... \$ 0.32 @ \$ 0.31

" 40..... \$ 0.32 @ \$ 0.31

Spring Wire, 2 cents per pound advance. Whitened Wire, 8 cents per pound advance. Flat, Square and Half-Round Wire, 4 cents advance on Round Wire. Fancy Wire, not less than 10 cents advance on Round Wire. Spooling on one-pound Spools, 12 cents per pound extra. Spooling on ten-pound Spools or more, 2 cents per pound extra.

MISCELLANEOUS TINNERS' STOCK.

1/4 & 1/2 Warranted..... \$ 15 @ 15 1/2¢

Extra..... \$ 14 @ 14 1/2¢

No. 1 Refined..... \$ 12 @ 12 1/2¢

No. 2 Solder..... \$ 12 @ 12 1/2¢

Extra wiping..... \$ 11 1/2 @ 12 1/2¢

Rivets.

Iron and Tinned, new list, Dec. 10, 1881..... dis. 55¢

In bulk, new list, Dec. 10, 1881..... dis. 55¢

Copper Rivets and Burrs..... dis. 50¢ @ 60¢

Nos. 7 8 9 10 11 12 13 14 15

\$ 1.40 50¢ 50¢ 54¢ 56¢ 58¢ 60¢ 65¢ 70¢

American Screw Co.'s..... dis. 65¢ @ 5¢

R. B. & W..... dis. 67 1/2¢ @ 5¢

R. E. Mfg. Co..... dis. 65¢ @ 5¢

FRENCH GLASS.

January 27, 1885. Per Box, 50 feet

(Concluded from page 1.)

its surface. To the boxes or journals that carry the car axles, and from the inside of the wheels two 2 inch by $\frac{1}{2}$ inch bars are attached, bent down in the center to within three inches of the track, and toward each other until at the center of the car longitudinally, they are, say, 12 inches apart. This constitutes a frame for the boxes, through which run the axles that carry the sprocket wheel. These boxes can slide up and down in guides 7 inches, and this hoist of 7 inches can be made and still clear the bottom of the car. It is clear that if this sprocket wheel be left loose, and in connection with the running rope below, it will simply revolve and the car will stand still. But one end of the strap-brake about it is attached to the frame, and the other to a bar lever from which a chain runs to a winding post on each end of the car. As the driver tightens up his hand-wheel and arrests the motion of the sprocket-wheel the car must move until, when the wheel ceases to turn, the car goes as fast as the cable. If, again, the chain from the sprocket-wheel brake is wound about the winding post from right to left, and the chain from the car brake goes about the same post from left to right, one motion of the wheel in the hands of the driver puts on the car brake and lets off the sprocket-brake, and vice versa, thus putting the car absolutely under the control of any man who knows enough to turn a wheel.

The sprocket wheel has a lateral motion of 2 inches, to take up unevenness in the track gauge, but always centers when out of gear by strap springs resting against the ends of the sprocket axle, fastened to the outside of the boxing. The sprocket-wheel may be put upon every car in the service, which is then, indifferently, a grip car or a horse car, with less than 200 pounds added weight, at the will of the driver. It follows that any one part of a system may be cable, and yet any car in the service will run on any part of the railway company's system. The wheels of the cable trucks are 6 inches in diameter, made of cast steel, and bored for a 1-inch axle. This is of soft steel, with ends riveted up into a countersunk face of the wheel, so making all fast. The tread of the wheel is made concave, and babbitt metal rings are run into place, deadening any noise in operation. The journal that surrounds the axle is open for one-third of its circumference below the center, and goes on down forming an oil box to hold oil and waste, thus adopting the exact principle of the railway journal and oil box. This truck is held rigid, fore and aft, by buttons, but is allowed free motion around the rope, so permitting the rope to twist freely in running. The sprocket-wheel can be lifted from connection with the cable by the driver pressing a foot lever, on either platform, in an instant, and the car then becomes a horse car with less than 200 pounds added weight. The wheel can be dropped back into connection with equal facility. Special arrangements are made for crossing draw-bridges and ordinary street crossings.

The trial line, now running in Chicago, demonstrates the following facts: No exclusive grip car is needed; each car is its own motor, and the machinery (one wheel) is below the floor of the car, out of the way and noiseless; the driver has only the same winding post to handle he always had; no experts are needed; it takes less skill to manage the car than to drive a team. The tube is a perfect self-cleaner under all circumstances, in all kinds of weather. There is no friction wear on the cable, and it is not possible for the driver to strand or break the cable by carelessness or ignorance. The car starts, stops, or varies its speed at the will of the driver, without jerking.

The cost of the system, of course, will vary greatly with the service demanded, but the entire plant for heavy city traffic, including power in place and all in operation, will, it is said, not vary much from \$20,000 per mile. The cost of the track, paving, cars and engine-house are not included in this estimate. A construction suitable to small cities in every way ample for the service demanded could be brought within \$15,000 per mile, while a modification of this system, designed for use on single track roads, could be adopted at still less cost.

Sir Joseph Whitworth.

An entertaining and instructive address on "The Mechanical Genius and Works of the Late Sir Joseph Whitworth" was recently delivered before the Engineers' Club, of Philadelphia, by Mr. John Fernie, M. Inst. C. E., of England. From it we take the following particulars:

Joseph Whitworth was trained in a cotton-spinning machine shop in Manchester, and when he had finished his apprenticeship he went to London to get a better knowledge of his business than he could get in Lancashire. Those who have studied the life of Watt will remember that he did the same thing. So, in later years, Mr. Nasmyth tells us, in his delightful Autobiography, how he went to London to improve himself in the mechanic art, and what he learned at Maudsley's, and what exquisite work was made there. Joseph Whitworth, employed as a workman, soon distinguished himself by his skill, and was for some time employed in Mr. Maudsley's private workshop, where his finest work was done.

It was as a working man, fighting his way upward in the world, that he made his greatest invention, how to make a true, plane surface. The reasoning out of the process by which this was effected, "the superposition of three different planes and the cutting away of the higher points by a scraper, as compared with the old plan of filing and grinding, brought about a revolution in the workshops of the world," was most astonishing as the work of an uneducated man, for what the ancient mathematicians supposed and dreamt about, "a perfect plane," this man accomplished while toiling at his bench in Maudsley's workshop. Mr. Whitworth, after leaving Maudsley's, was employed at Holtzapfel's & Clement's Works, and it was in the latter that he was employed on Babbage's famous calculating

machine. Having perfected himself as a workman, he now started in Manchester as a tool maker, and very soon made his name known as one who did only the very best work. No one could have started at a more

tools, and I hasten on to his improvements in screw threads.

Mr. Whitworth was early impressed with the idea that if it were possible for all engineers to use the same sized taps and dies,

at once adopted by the railways, and very soon became as universal as if it had been by an Act of Parliament. Only those who remember the chaos which existed before Whitworth's system came into use can

lishing a system of fine measurement. To the great exhibition of 1851 he sent a measuring machine, capable of measuring to the one-millionth part of an inch, and some years afterward, in a paper read at the Institution of Mechanical Engineers, advocated the adoption of the inch as the standard of measure for all mechanical engineering work, and that, instead of dividing it into eighths, it should be divided into tenths, &c. I may here briefly state that I was the first to adopt this system. I did my fine measurements with a machine after my own style. I proved that the system he sought to establish was a practicable one, and my adoption of it, as an independent worker, perhaps brought it quicker into general use.

Mr. Whitworth had now accomplished the following great improvements in mechanical science: 1. His plane surface. 2. His system of uniform screw threads. 3. His system of fine measurement. Mr. Whitworth was now called by the War Department to undertake a series of experiments on the best form of rifle to be used in the army. These experiments, which were the most valuable and exhaustive of their kind, led him to adopt a rifle with a very small six-sided bore, the corners of which were rounded, a very quick twist of rifling and a steel barrel. With this rifle he obtained the lowest trajectory, and the greatest penetration with the smallest quantity of powder consumed, and he presented it to the Government, charging nothing for his labor. The Government did not, for various reasons, accept his rifle, and he then proceeded to apply the same principles to artillery. Again he was able to prove that the principles he had applied to the manufacture of rifles was a right one for artillery, but the Government would not accept his artillery, and he would allow no alteration in his designs, and the guns of Sir William Armstrong were adopted.

It was during his experiments on rifles that he was led to manufacture steel. He very soon found that iron could not be depended upon for his barrels, and he found so much variation in steel from the makers that he determined to investigate it, and built a small steel works where he could carefully test, under his own eye, the steel best suited for his work. He adopted a mode of testing his samples which was all his own. His samples were cylinders, some 4 inches long, bored and turned to gauge, a measured quantity of powder was placed within them, the ends were secured in a hydraulic press, and the powder discharged by electricity, and this process was continued till the sample burst. His experiments on steel led him to adopt a system of casting steel under compression, which he patented, and to the improvements of which he devoted the last years of his life, and from which he expected the greatest results. So satisfied was he of the value of this invention that, when approaching his 80th year, he determined to build large new steel works outside the City of Manchester, using for that purpose a large sum of money he had obtained from the sale of his old works in Manchester, which, being in the center of the city, had become very valuable.

At the last great exhibition in Paris there were some samples of steel forgings, the like of which had never before been seen. They consisted of a heavy intermediate shaft for a screw propeller, and two liners for the steam cylinders of a steamship. The shaft was cast hollow and was partly turned to show how beautifully true it had been forged, and there appeared to be literally nothing required to be turned from it. So it was with the liners; these were not from the great forges of Yorkshire, or from the great steel works of Krupp; they were the work of an old infirm man close on to 80 years of age, who knew nothing about forging till over 60, but who, when young, commenced by making everything he did as near perfect as it was possible, and who leaves as his monument the most perfect, the most novel forgings ever produced.

Mr. Whitworth deeply felt the want of a good education, and many years ago gave the sum of £100,000 to provide a fund for the mechanical training of likely young men. For this he received from the government a baronetcy, but he left no sons to succeed him in his title. He died as he lived, working and toiling to the last.

Wooden Water Pipes.—Wooden pipes, says Mr. A. H. Howland in a paper on "Water Pipes" in the last volume of the proceedings of the Engineers' Club of Philadelphia, are used to a limited extent in the northern central portion of the country, and are, I believe, the only pipes in which the diameter increases with use. They have many advantages and a considerable number of disadvantages. Their bulkiness, short lengths, the difficulty encountered in joining them together and maintaining a joint under all conditions, renders them a questionable article. When made of good, soft pine they are unobjectionable, from a sanitary point of view, as water conveyors. In some soils they have proved very durable, while in others they have lasted but a few years. In order to strengthen this pipe, and make it possible to use a larger diameter of bore in a given size of log, they are sometimes wound spirally with wire or small hoop iron and afterward dipped in hot tar and sanded.

The North Chicago City Railway Company, of Chicago, Ill., are pushing the work on their cable road with great energy. They have been operating the line with horses, which will be superseded by the new motive-power that has proved so successful on other Chicago street railways. In consideration of the privilege of running their line into the heart of the city, the company have agreed to build new iron bridges over the Chicago River at Wells and Clark streets, and to remove the present Wells street bridge to Dearborn street, where there is no bridge at present. They have also agreed to put in order the La Salle street tunnel under the Chicago River. The company will expend, it is estimated, about \$5,000,000 in these improvements, which are expected to be of great benefit to property interests of North Chicago.

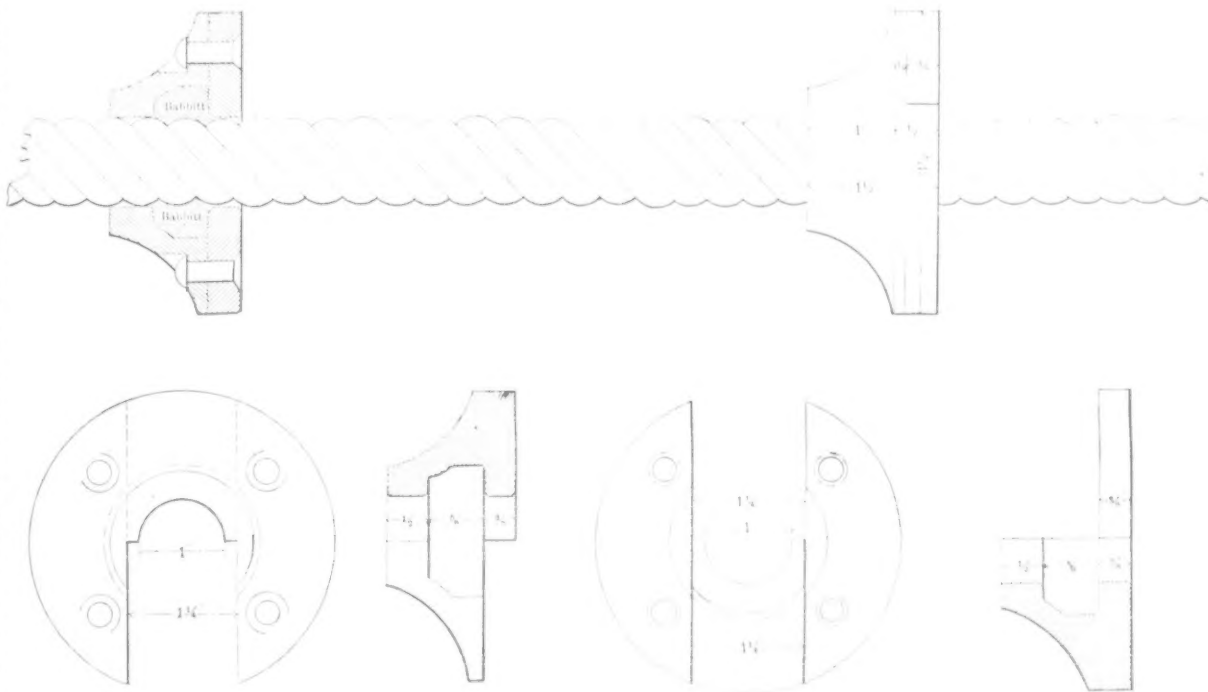


Fig. 4.—Details of Buttons, &c.

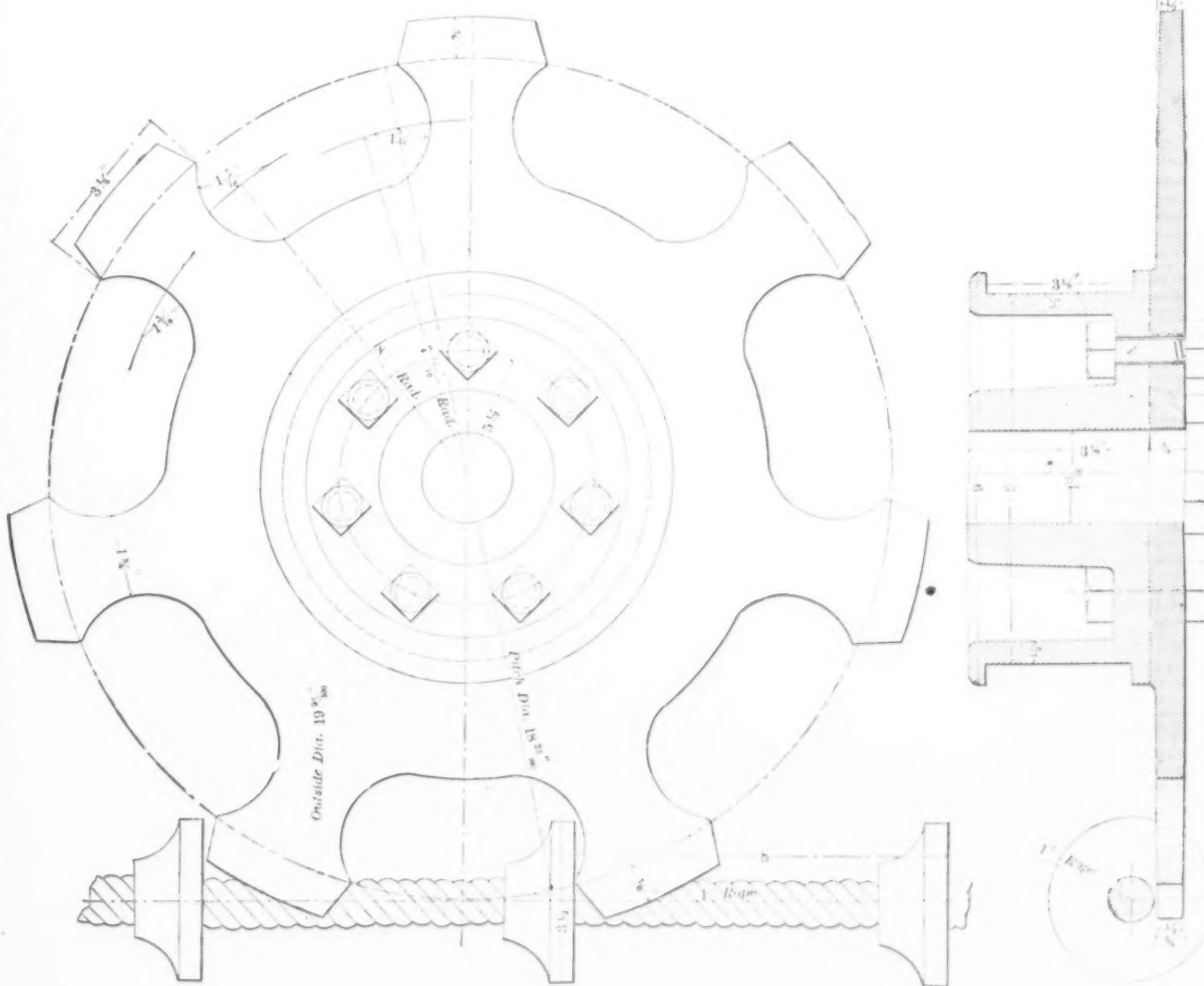


Fig. 5.—Elevation and Section of Sprocket Wheel.

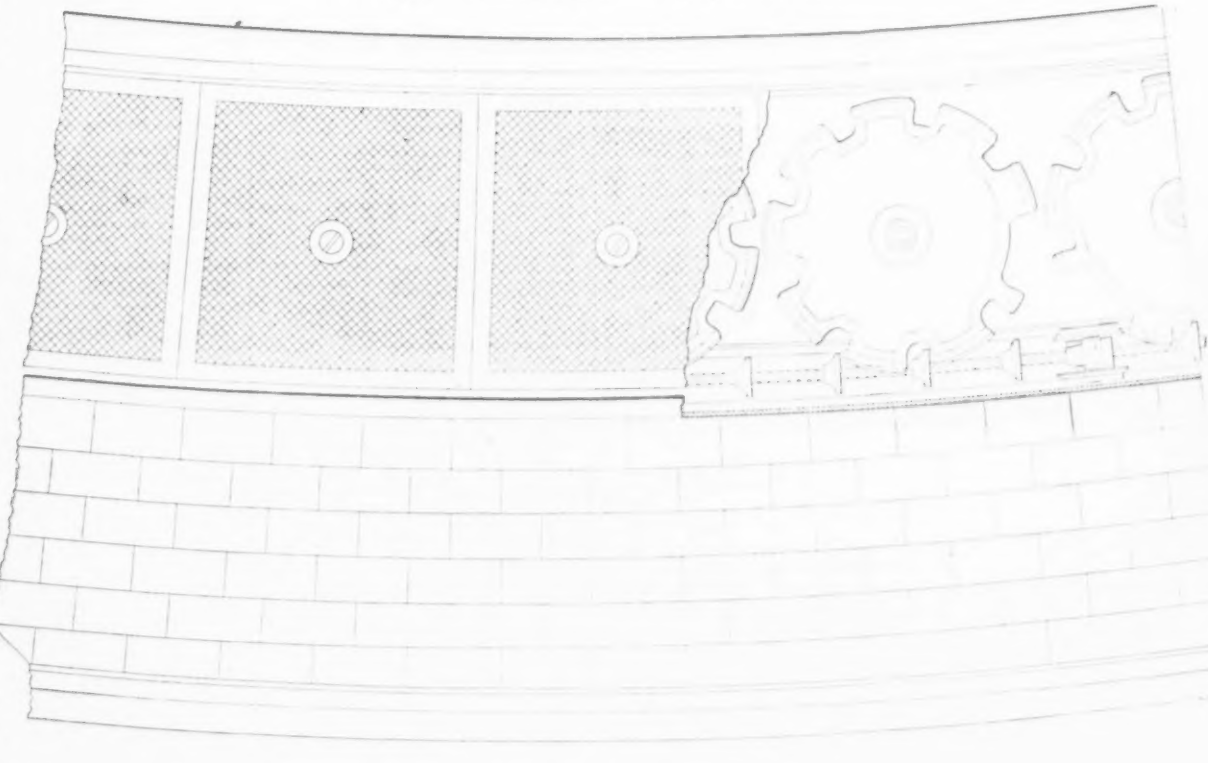


Fig. 6.—Plan of Curve Construction.

THE RASMUSSEN CABLE SYSTEM IN CHICAGO.

opportune time. Railways and steamboats were developing all over the world, and good tools could hardly be made quick enough, and he very soon realized a large fortune. It would be impossible for me to tell all that he did in the way of his improvements in

not only a very great saving would be effected, but all work would be much better done. He therefore made a collection of all the screw threads of the different firms in England, and from these laid down a system which was a compromise of them all, was

have any idea of the confusion and waste of time and money which existed when everybody had their own thread and pitch, and declared that theirs was the best in the world. Mr. Whitworth's next great work was in estab-

Index to Advertisements.

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MANUFACTURING.

Iron and Steel.

Work has been commenced on the construction of a new double open-hearth steel furnace by Park Bro. & Co., Limited, of the Black Diamond Steel Works, at Pittsburgh. It will have the latest improvements, and each furnace will be 30 tons capacity, with hydraulic cranes and all machinery necessary for their successful operation. When this furnace is finished it will be the fifth 30-ton open-hearth furnace at the Black Diamond, in addition to two 15-ton furnaces. This makes a total capacity of 360 tons per day, allowing two melts for each furnace, which is said to be the largest open-hearth product turned out by any steel plant in the world.

Isaac McHose, superintendent of the Cordelia Furnace, at Columbia, Pa., informs us that at the report that the furnace, after being thoroughly repaired and blown in, was compelled to suspend operations for further repairs, is without foundation. The furnace was recently blown out after a long, successful blast, the lining being burned through in several places. It will blow in again during the present month on Bessemer pig.

M. V. Smith, metallurgical engineer, of Pittsburgh, has received the contract for the construction of all the gas furnaces to be erected in the new plate mill of the Catawqua Manufacturing Company, of Catawqua, Pa. Last year Mr. Smith constructed 63 furnaces for producer and natural gas. Since January 1, he has closed contracts for 43 furnaces, most of which are for producer gas. He has now in successful operation furnaces for heating nail-plate slabs, heavy bar mill work, light bar mill work, guide and hoop mill, skip mill and puddling.

The firm of Wm. Clark & Co., proprietors of the Solar Iron Works, Pittsburgh, was dissolved in the first inst., by mutual consent, Sarah A. Fowles and Henry C. Fowles retiring. The business of the firm will be continued by J. M. Clark and Edward L. Clark, under the name of Wm. Clark & Son & Co.

The Ohio Iron and Coal Company, of Ironton, Ohio, elected the following directors, on the 4th inst.: E. B. Willard, Oscar Richey, H. C. Burr, C. C. Clarke, W. D. Kelly, H. S. Neal, Hiram Campbell.

The improvements made in the Bloom furnace of Wm. Neal & Sons, Bloomsburg, Columbia County, Pa., will considerably increase its output, probably to 800 tons a week. The improvements consist of additional hot blast, increased boiler surface, and additional height of stack.

A certificate has been filed in the office of the Secretary of State of Illinois to record the change of name of the Congdon Brake Shoe Company, of Chicago, to Calumet Foundry Company.

The par value of the stock of the Bethlehem Iron Company is \$100 per share. A year ago it sold as low as \$10 per share. To-day it is worth \$180.—*Catawqua (Pa.) Dispatch.*

The Walker Iron and Steel Company have been incorporated at Detroit, Mich., with a capital stock of \$250,000, for the purpose of mining and manufacturing iron and coal. The incorporators are Columbus P. Patterson, of Detroit; Adna E. Kendall, of Toledo, Ohio; and Earl L. Shephard, agent; George N. Robinson, John S. Glidden, trustees, of Cleveland, Ohio.

The Cunningham Iron Works Company, of Boston, have been awarded the contract for building the water-tower for the town of Haverhill. This is the largest tower ever built, being constructed of boiler plates 7/8 inch in thickness, with a tensile strain of 50,000 pounds, and weighs over 200 tons.

The old board of directors of the Fall River Iron Works, of Fall River, Mass., are succeeded by the following: M. C. D. Borden and Cornelius Bliss, of New York; Thomas J. Borden, A. S. Tripp, and A. S. Crevel, of Fall River. Mr. Borden was chosen president of the company.

The American Tube and Iron Company, of Youngstown, Ohio, are erecting a butt mill which will give employment to about 350 men and boys. The works at present employ 375 men, and has more orders than it can fill.

The work of repairing the Minerva furnace at Milwaukee, Wis., is being rapidly pushed toward completion, and if nothing happens to delay matters the furnace will be blown in on May 1. Fire was placed under the boilers on the 2d inst., and steam raised for the purpose of testing the pumps and other machinery. The carpenters have nearly completed their contract of building new trestle works from the docks to the furnace. The work of relining the stack has been somewhat retarded by a delay in receiving several shipments of fire-brick.

The nail-plate mill of the Bay View Rolling Mills at Milwaukee, Wis., was employed last week in rolling fish-plates, for which there is such a demand that the company can hardly keep abreast of their orders. The growth of the fish-plate department of the mills has been wonderful. When the North Chicago Rolling Mill Company first purchased the works one small punch, kept moderately busy, could do all the work, but now it requires four, two of which are of extraordinary capacity, to meet the demand.

The Sloss Steel and Iron Company, with a capital stock of \$3,000,000, and the Coalburg Coal and Coke Company, at Birmingham Ala., have effected a consolidation. The new company have two furnaces in Birmingham and will erect two more at once—all hundred-ton furnaces. They will also build a large steel plant to make a thorough test of Alabama ore. The company own 38,000 acres of coal and iron lands.

The Maumee Rolling Mills, located on the east side of the Maumee, at Toledo, were destroyed by fire on the 10th. The rolling mill building and machinery is a total loss. The office, machine-shop and blacksmith-

shop were the only structures saved. The loss is estimated at \$300,000, according to the statement of the president of the company.

Dispatches from Birmingham, Ala., state that the Debardeleben Coal and Iron Company have determined to erect immediately at Bessemer another furnace plant in addition to one now nearly completed, to consist of two 17 x 75 foot furnaces, seven Whitwell stoves, blowing engines and 300 additional coke ovens, making 600 coke ovens in all. They have also purchased 50,000 acres additional land, consisting of more than 20 miles of the celebrated red and brown ores in Murphree's Valley, now being penetrated by the Bessemer and Huntsville Railroad, with a large body of coking coal in the Warrior field. This makes 100,000 acres of mineral lands owned by this corporation. Their headquarters and furnace plant are located at Bessemer.

The charcoal chemical plant of the Decatur Land Improvement and Furnace Company, at Decatur, Ala., is nearly completed, and the ovens are being filled with wood. The first output of wood alcohol and charcoal will not be before May.

Machinery.

The Scaife Foundry and Machine Company, Limited, of Pittsburgh, having purchased the Atlas Works, on Twenty-eighth street, moved their plant thereto on April 1.

The Warner Machine Company are erecting large works at Southwest St. Paul, Minn., for the manufacture of nuts, bolts, car forgings, and bridge and architectural iron work. They are just placing orders for a large amount of machinery, have placed an order with Long & Alstatter, of Hamilton, O., for a large shearing machine, and with the National Machinery Company, for a nut tapping, bolt, screw, and nut pressing machine for making cold pressed nuts, and are rapidly putting in machinery of the latest improved pattern.

The Rohan Bros. Boiler Mfg. Company, of St. Louis, Mo., have recently completed a conduit for a Mexican mine, measuring 400 feet in length, and occupying six cars when shipped.

The Empire Machine Company, have been incorporated at Richmond, Ind., to manufacture the Empire fence machine and other mechanical devices and apparatus.

The D. E. Whiton Machine Company, of New London, Conn., write to us as follows, under date of April 9: "We are at work making special tools and machinery for our new lines of drill and lathe chucks, on which several patents have been allowed, and will shortly be issued. We have completed a few samples, which meet the unqualified approval of all mechanics who have seen them. The year has opened very favorably with us, and we have been very busy on nearly all our old lines, particularly so on centering machines and gear cutters, of which we have sold a good many since January 1, 1887."

The Dempsey Machine Company have been organized at Akron, Ohio.

The Volker & Felthousen Mfg. Company, of Buffalo, N. Y., write to us that they are at present running 14 hours per day, turning out the "Buffalo Duplex Steam Pumps." Their sales, they say, are increasing rapidly.

The Babcock & Wilcox Company, 30 Cortlandt street, New York, announce the following sales of their boilers during March, 1887:

Horse-power.	
Singer Mfg. Company, Montreal, Canada, 152	
United States Senate, Washington, D. C., 312	
E. Jenckes Mfg. Company, Pawtucket, R. I., 240	
Cardenas Sugar Refinery, Cardenas, Cuba (sixth order), 208	
Fennesse Coal, Iron and R. R. Company, South Pittsburgh, Tenn., 624	
Gadsden Alabama Furnace Company, Gadsden, Ala., 624	
Gordon, Strobel & Laureau, Limited, Philadelphia, Pa. (fifth order), 480	
The Journal Company, Kansas City, Mo., 200	
J. Langdon & Co., Inc., Saginaw, Mich., 208	
Metropolitan Street Railway Company, Kansas City, Mo., 600	
Francis Axe Company, Buffalo, N. Y. (third order), 61	
E. C. Knight & Co., Philadelphia, Pa. (third order), 480	
Dalzell Axle Company, South Egremont, Mass., 122	
National Tube Works Company, McKeesport, Pa., 156	
Total, 4,407	

The Gas-Motoren Fabrik Deutz, of Deutz, Germany, who own the "Otto" patents in Germany, and who attracted attention of late by the large sizes of Otto engines furnished to city waterworks and electric light stations, have just obtained a decision in their favor in their suit against Moritz Hille, of Dresden, a manufacturer, and several of his clients and users of infringing engines. The decision establishes the infringement by the defendants and orders them to discontinue the manufacture and use of the machines; also to account for damages. The Hille engine used the well-known Otto four-stroke cycle, and it is against its use also that other suits still pending against Körting Bros. and Buss, Sombart & Co. are directed. In these cases a decision may soon be expected.

A correspondent at Decatur, Ala., sends us the following items of interest: "Work has begun on Ivens & Sons' foundry for the manufacture of boilers, engines and heavy iron goods. The capital invested is \$160,000 and 200 mechanics will be employed. The building to be used by the Morse Cotton Compress Company has also been commenced. The capital is \$50,000, and during the season at least 100,000 bales of cotton will be compressed and 40 hands employed. The Iron Bridge Construction Company, manufacturers of bridge iron, have the foundation of their works laid and a part of the building up. A company of Cincinnati capitalists have contracted for the building of a saw and planing mill in Decatur and will manufacture doors, sash and blinds. Capital, \$50,000. The machinery has been bought and the works will be in operation in 60 days."

Hardware.

The employees of the Reading Hardware Company, at Reading, Pa., recently asked the company for an increase in the wages of all the employees of 15 per cent., the em-

ployees having appointed a committee to wait upon the superintendent of the works for the above purpose. After consideration the company decided to increase the wages of the iron molders 15 per cent., the polishers 5 per cent., and the other employees in the same proportion.

The Southington Cutlery Company have been making a number of changes in their knife department, and are about ready to put a number of men to work. Of the 100 men who went on strike last November nearly one-half have left town, a few came back to work, and now it is said several more will go back.

William Rose & Bros., manufacturers of plasterers', molders' brick trowels, &c., Philadelphia, advise us that owing to the pressure of orders they are at present compelled to run at night.

The Ohio Lantern Company, of Bellaire, Ohio, have decided to remove their works to Findlay, Ohio, where they have in course of erection a four story fire proof factory, 50 x 150 feet, with all the latest improvements in the way of conveniences. They expect to at least double their present capacity. The building will be completed by August 1, and until that time they will continue to run their factory at Bellaire.

Miscellaneous.

The Reading Company engaged in operating the Phoenix plumbago mines, at Byers, Chester County, Pa., will tear out the machinery, which cost about \$12,000, and introduce a new and improved outfit. The works will be placed in charge of men from Ticonderoga, N. Y., thoroughly conversant with the business, and graphite will be manufactured for black-lead crucibles.

The Laclede Car Manufacturing Company astonished their neighbors, and, in fact, all the manufacturers in North St. Louis, on Saturday last, by making a shipment on that day of 26 cars. Of this number, 22 were billed to the Metropolitan Cable Railway, of Kansas City, and the remaining four to Greenville, Miss.—*Age of Steel, St. Louis.*

A certificate of incorporation has just been issued to the Mound City Gas Company, of Parkersburg, W. Va., to bore for oil, natural gas, operating and constructing lines, &c. Capital, \$100,000. Joseph W. Craig, of Pittsburgh, 60 shares; George L. Craig, of Pittsburgh, 10 shares; and A. Lawrie, of Washington, Pa., 10 shares, are among the incorporators.

The Barnes Brothers' Clock Company, of Bristol, Conn., at a recent special meeting, voted to discontinue their business, to distribute their capital stock among the stockholders, and to apply to the Superior Court for a decree of dissolution of the corporation, which has been granted.

The Stockholders of the Allegheny County Heating Company, of Pittsburgh, have elected the following directors: H. H. Westinghouse, president; George Westinghouse, Jr., Robert Pittman, C. H. Jackson, Charles Paine, John Colwell, C. L. Magee, J. F. Denniston, J. E. Ridall.

The mammoth plant of the Pennsylvania Railroad shops, at Altoona, Pa., will be greatly increased this summer. Work has already been begun on two new departments, and plants are under consideration for others. The railroad authorities contemplate building one complete locomotive daily hereafter. A capacious reservoir will also be built near the city by the Pennsylvania Railroad Company this spring.

The Pennsylvania Natural Gas Company, of Pittsburgh, has finally decided on its plans for the coming summer. They include some of the most extensive improvements that have been made in gas plants within the past two years. Over \$500,000 will be expended in new lines and wells, while in all probability the company will develop some entirely new gas territory within the next six months.

The Iron Mines of Minnesota.—I.

BY JOHN BIRKINBINE, PHILADELPHIA.

The most important development of iron ore in Minnesota is near Tower, St. Louis county, a town which owes its existence to the opening of a large deposit of specular iron ore by the Minnesota Iron Company. In exploring the country in the year 1875, in the neighborhood of Vermillion Lake, about 70 miles northwest of Lake Superior, a fine outcrop of ore was discovered on a ridge with a strike nearly east and west. After a critical examination of the exposure, test pits were sunk to determine the persistence of the ore body. The showing in them and the uncovering of outcroppings were so satisfactory that the present owners purchased large tracts of land, arranged for mining equipment, constructed a railroad from Agate Bay, or Two Harbors, through a then unbroken wilderness for 68 miles to the ore body, and erected shipping docks for handling the ore from cars to vessels. At the close of the year 1886 this railroad was extended 26 miles southwest from Two Harbors to Duluth. The beneficial effects of mining enterprises in developing and settling a country are evident in the operation of the Minnesota Iron Company. Two Harbors, which in 1883 had a single fisherman's hut, is now a well built village, with a population of about 400, with substantial brick machine shop, car shop and foundry, roundhouse for locomotives, and an ore pier extending 600 feet into the lake, provided with 130 pockets, of 110 tons' capacity each, making the dock storage 14,300 tons. The shipments from this dock up to date have been as follows:

	Gross tons.
1884, August 1 to November 1, 1886, May to November	62,124
1885, May to November	225,481
1886, May to November	301,393
The shipments of 1887 are estimated at	400,000

The town of Tower and the miners' villages adjoining the mines have a population of about 5000 living in comfortable homes (many of them the property of the miners), where until 1884 no white man had ever resided. Until then only a few had penetrated through the spruce and tamarack swamps

which compose much of the area between Lake Superior and Vermillion Lake. The mines of the Minnesota Iron Company are found in one of a series of nearly parallel ridges, dividing a great swamp into different drainage areas, from some of which the waters flow into Lake Superior, from others into Hudson's Bay, and from others into the Mississippi River. Within a radius of a few miles the waters find their way into the Atlantic Ocean, via the St. Lawrence River, and via Hudson's Bay, and also into the Gulf of Mexico via the Mississippi River. Geographically the present development is 50 miles due north of Duluth, about latitude 48°; to reach the mines from the lake the railroad ascends 1100 feet in the first 12 miles after leaving Lake Superior, and then crosses a series of ridges dividing the swamps at elevations of from 800 to 1000 feet above the lake, the latter being the approximate altitude of the mines—viz.: 1000 feet above Lake Superior, or 1600 feet above the ocean level.

THE ORE OPENINGS.

The present developments show apparent lenses of ore lying en echelon between nearly vertical walls—the foot wall being a slate and the hanging wall banded Jasper and "soap rock"; the widths and depths of the excavation vary—in fact, no absolute data concerning the depth of the deposit has yet been obtained, for all shafts heretofore sunk have been in ore. There are two apparent ore zones on different ridges about 1/2 mile apart, the larger workings being on the north ridge, the one nearest Vermillion Lake. The excavations are all open quarries, but in the future it is the intention to do much of the mining underground; the existence of ore between the two ridges has also been determined by wells, &c., sunk. On the north ridge the ore deposit is being worked almost continuously on a strike of about 1 mile—in fact, the openings are all operated under one management, and in several instances the workings run together. The openings along the north ridge are known by various names, and starting from west to east they may be described as follows:

The Breitung opening is about 100 feet long and 50 feet deep, showing irregular widths of ore from 10 to 40 feet, and a strike less defined than found to the east. The Tower No. 1 opening is 250 feet long, 100 feet deep, and the ore body is from 20 to 60 feet in width. At one point it was 155 feet wide. A shaft is now being sunk in the bottom and is 25 feet in ore. The Tower No. 2 opening is 150 feet long, 60 feet deep, and has an average width of 100 feet of ore. When the surface is stripped, a width of fully 200 feet is exposed, but this has not yet been reached in mining. The Ely opening is 400 feet long, 50 feet deep, and from 20 to 120 feet in width. The Stone pit is opened for 700 feet in length and 100 feet in depth, the ore body varying from 6 to 120 feet in width. A shaft is being sunk in the bottom, and is now down 300 feet. The Stuntz opening is 300 feet long, 50 feet deep and 20 to 60 feet wide.

On the south ridge there are two openings: The North Lee has been opened 200 feet in length, 50 feet deep and 30 to 40 feet in width; a shaft has been sunk 50 feet below the bottom and drifts are being run from this. The South Lee shows a vein 20 feet wide, exposed for about 100 feet in length, but little ore has been taken from this exposure up to the present time.

MINING EQUIPMENT.

The machinery at the mines embraces two compressors, 20 inches in diameter and 30 inches stroke, operating 30 Ingersoll rock drills in the various openings. Six steam engines drive six hoisting drums, 5 feet in diameter, and also range hoists which operate the 11 skips and hoists in the various excavations. Some of the skips are the ordinary iron bucket with wheels and bail, which is automatically dumped at the summit of the skip. Others are platforms on which cars are run at the bottom of the opening and lifted to the surface where they run off on other tracks. Cables are also used to handle cars through a tunnel leading from one of the openings to the dump pits. In one case mine cars are raised from the pit by a boom derrick to tracks at surface level, and in another a counterbalance with pulley sheaves returns empty cars up a long incline which they descend when loaded. Two 20 light dynamos driven by an independent engine furnish light for operating the mine continuously throughout the year, for to provide for shipping the ore during the six or seven months when navigation is opened part of the ore must be mined and stocked in winter. The rigor of the winter in Northern Minnesota would seem to preclude active operations in the open pits, but Captain Moreau stated that although during the season just closed the thermometer at times indicated 30° and 40° below zero, work had not been suspended a day, the dry, still atmosphere making it possible for labor to be performed with less discomfort than in other regions where a higher winter temperature is accompanied with dampness or penetrating winds.

The ore is very hard, and must all be removed by explosives, dynamite, with about 50 per cent of nitro-glycerine, being chiefly used, but the hard character of the ore has its compensation in furnishing firm pillars for future underground workings, and in being richer in metallic iron than the softer ores. An interesting study of glacial action is offered by the faces of the great ore body as exposed by stripping; this has in some cases deeply scored the hard ore, and in others polished great surfaces to nearly a metallic luster. The stripping will scarcely average 8 feet of bowlder drift; the greatest depth so far encountered is 25 feet, and for a considerable portion of the strike the ore protruded from or lay just beneath the soil.

QUALITY OF ORE.

The character of the ore is a hard specimen of unusual richness. In physical character the ore more closely resembles that taken out of the Champion mine in the Marquette district, and some of the best specimens from the Ashland mine in the Gogebic region. To indicate the character of the ore chemical analyses will be quoted,

but a more reliable index is in the fact that the Minnesota Iron Company have made a contract for the current year, which is for the delivery of 135,000 gross tons of ore guaranteed not to average below 67 1/2 per cent. metallic iron, and with phosphorus not to exceed 0.06. In addition, the company will ship over 200,000 tons of ore guaranteed to average at least 67 per cent. of iron, with phosphorus 0.06, and 10,000 to 50,000 tons of ore guaranteed to show between 62 and 64 per cent. of iron, with phosphorus at 0.6 per cent. and upward. There are one or two companies who could deliver large amounts of ore as rich in iron and as low or possibly lower in phosphorus, but there is probably no iron-ore company in the United States that would undertake to meet the above guarantee for 350,000 tons of ore in 1887.

One of the most impressive features of the visit to these mines at the close of March, 1887, was the stock of over 100,000 tons of magnificently prepared ore, all of which would yield over 62 per cent. of iron, and fully 80 per cent. of it 68 per cent. or over of iron. Such a sight would startle some of our furnace managers who are familiar with ores yielding from 55 to 50 per cent. of iron. When we remember that the anhydrous sesquioxide of iron contains 70 per cent. of metallic iron, we can realize how close to chemical purity this specular ore must be to permit a guarantee of 67 1/2 per cent. of iron. The following were copied from the regular daily analyses taken by Mr. F. Prince, the mining engineer of the Minnesota Iron Company, and cover all determinations from January 1 to April 1, 1887, access to these records being permitted by Mr. C. Tower, Jr., the managing director of the company, whose courtesy also permitted a full untrammelled examination of all the details of this great enterprise; for surely a mining company who in their third year rise to the second place among the ore producers of the United States are entitled to be ranked as great.

The Cornwall Ore Bank Company mined and shipped from the Cornwall ore hills, in Pennsylvania, about 600,000 tons of ore in 1886, and it is doubtful if any other mining company occupied a position between this figure and the 304 3/4 tons shipped by the Minnesota Iron Company. But it must be remembered that, while the Cornwall ore output would produce less than 300,000 tons of pig iron, the shipments of Vermillion ore would make over 200,000 tons of metal.

ANALYSES OF VERMILLION ORE.

An examination of 115 analyses, made of Minnesota Bessemer ore, as taken to the stock pile, from January 1st to March 31st, 1887, shows an average of:

Iron, 67.7; phosphorus, 0.06; silica, 1.5.	
The lowest determined on was:	
Iron, 65.29; phosphorus, 0.067; silica, 3.79.	
And the highest was:	
Iron, 69.28; phosphorus, 0.049; silica, 0.68.	

But under the same date that the above determination was made of ore taken from the North Lee stock pile, another analysis of ore from the pile on the other ridge, at East Tower opening, showed:

Iron, 69.16; phosphorus, 0.059; silica, 0.97.	
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The phosphorus in the Vermillion ores varies considerably, the extremes being from 0.021 to 0.110; but in most of the ores now found it is between 0.04 and 0.07, so that the company can readily maintain the guarantee of 0.06 per cent. The following are complete analyses of the ore taken from the different stock piles, and analyzed by Mr. Prince:

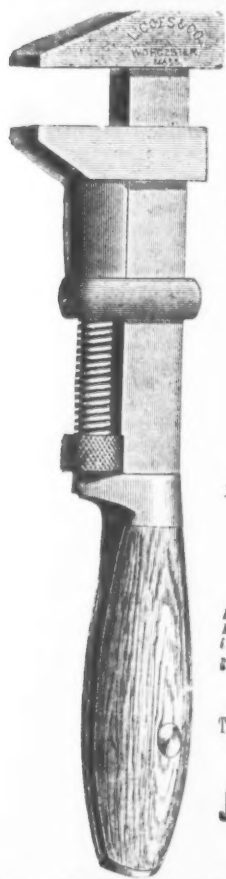
Iron, 67.39	68.37	68.32
Phosphorus, 0.054	0.052	0.049
Silica, 1.35	1.10	1.31
Alumina, undetermined	0.59	0.25
Magnesia, 0.085	0.041	nil.
Sulphur, 0.005	0.007	nil.
Loss by ignition, undetermined	0.5	0.6

It is noticeable that the leaner ores are of practically the same composition, except as to silica, as the rich ore, indicating that the inferior ores are those which, lying near the walls or horses of rock, carry free silica. In mining this ore, as above stated, two grades only are made; the great bulk of the ore (fully five-sixths of all that is mined) is sold as "Minnesota Bessemer" and is guaranteed to contain: Iron, 67 1/2 per cent. or over; phosphorus, 0.06 or under; while the second grade of ore, "Red Lake," is merely the ore which, being mined close to the walls or "horses" of rock, it has more free silica, but is sold to yield iron 62 per cent. or over; phosphorus, 0.06 per cent. or under. In mining the ore the walls are fairly well defined, so that but comparatively small quantities of it are taken off with the ore. The dump piles of refuse would, however, show from 25 to 45 per cent. of iron. Some of this refuse is used for metallizing the road bed of the

DULUTH AND IRON RANGE RAILWAY.

and as a consequence the character of the track is above the average of Western railroads. The section along the shore of Lake Superior from Duluth to Two Harbors is new, and has not yet been thoroughly ballasted, but the 70 miles from Two Harbors to the mines can be safely described as first class. Laid with 60-pound steel rails on large sills and well ballasted, the substructure across the swamps being a corduroy 3 feet thick supporting stone ballast, the road, under efficient management, is just what is demanded to transport from 200 to 300 gross tons of ore per day over it during the shipping season.

The company use large eight-wheel ore cars, with a capacity of 24 gross tons each, and haul from 150 to 500 tons to a train with their large consolidation locomotives. Coming from the mines the steepest grade is 66 feet per mile, and the prevailing grades favor the trade. Returning with the empty cars the grades for the first 3 miles out of Two Harbors is 132 feet per mile, and for the first 12 miles covered in crossing the shore hills of Lake Superior the grades average over 90 feet. Considering the difficulties attending the location of a road through an unbroken wilderness, the alignment and gradients reflect credit upon Mr. R. H. Lee, who made the survey, and who now has the management of the road. In estimating for ore in stockpiles it is found that 9 cubic feet will weigh 1 gross ton.



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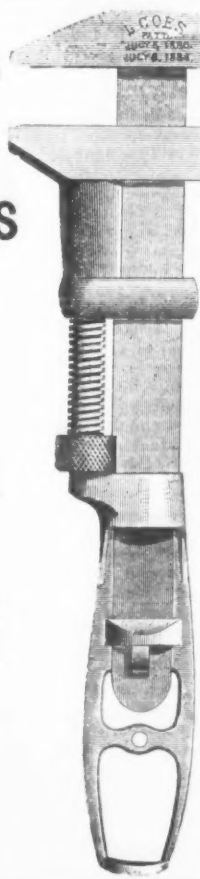
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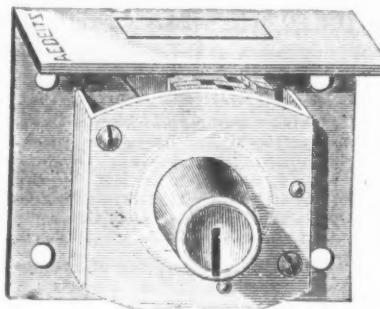
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Iron Frame and Shank of Bar keyed
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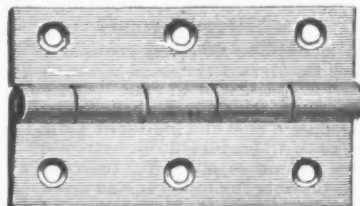
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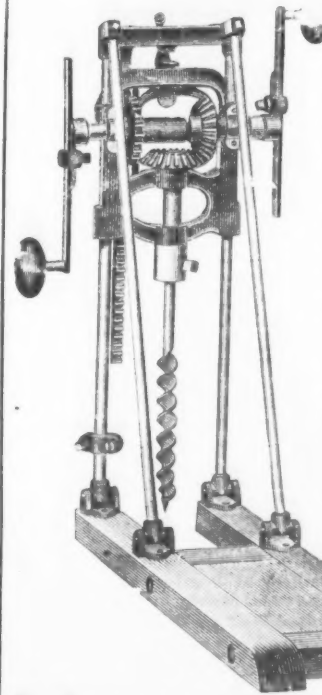
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MILLERS FALLS BORING MACHINE.



THIS Machine has been fully perfected in all its parts, and is now sold with full warrant that it will do better work and give better satisfaction than any other kind in use. The frame is made of half-inch round steel rods; the braces are the same and attach to the rods at the top by a set screw. When this set screw is loosened, the frame falls over so as to bore at any desired angle.

The depth of hole to be bored is fixed by a stop, as seen on the left hand upright rod in the cut. When the gate strikes this stop a latch is lifted and the machine throws itself into gear by the use of a spring, and the Auger is lifted out of the hole by continuing to turn the crank in the same direction.

When the Auger is drawn from the hole the frame hangs itself up until the machine is moved to the next hole, then it is dropped down by turning the crank back until the Auger strikes the wood, when it is thrown out of gear and proceeds to bore the next hole. As seen in the cut, the machine has adjustable cranks which fully regulate its speed and power.

PRICES:

Machine, without Augers, - \$7.50
Augers in sets, 18, 23, 41 quarters.
\$3.00 \$3.75 \$6.75.

Sizes of Augers (1, 1 1/2, 2) (1, 1 1/4, 1 1/2, 2)
(1/2, 3/4, 1, 1 1/4, 1 1/2, 1 3/4, 2)

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74 Chambers Street, New York.

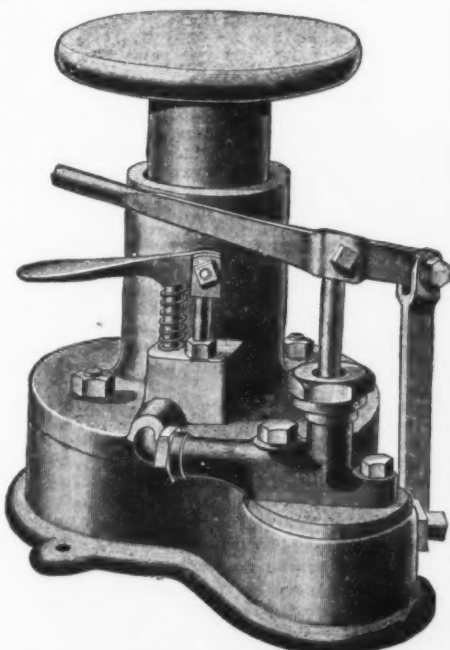
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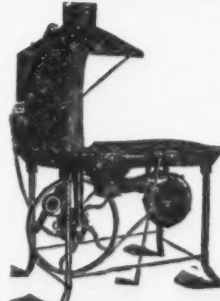
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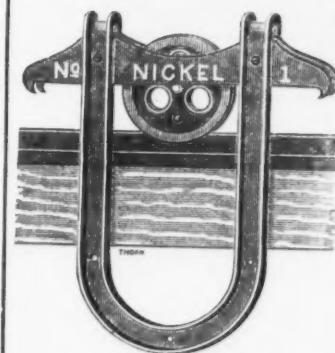


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The accompanying cut represents our four-pointed, painted or galvanized
Quality Best.
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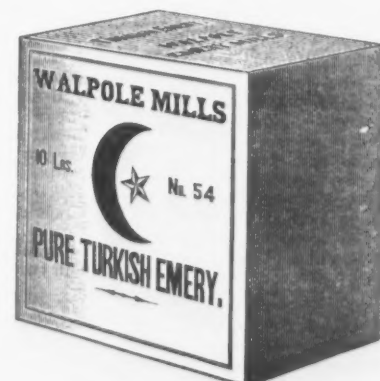
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The New Mexican Tariff.

We are indebted to the Mexican *Financier* for the following transcript of the new Mexican tariff, from the official text, from which we have eliminated those articles not likely to prove of interest to our readers:

The New Free List.

An asterisk shows that the article is on the free list of the existing tariff.

- * Telegraph wire.
- * Anchors, with and without chains, for vessels.
- * Flows and their shares.
- * Quicksilver.
- * Coal of all classes.
- * Houses complete, of wood and iron.
- * Coaches and cars for railways.
- * Vessels of all kinds.
- * Iron and steel rails for railways.
- * Bricks of refractory earth.
- * Steam engines, locomotives, and other things necessary for the building of railways.
- * Cars for vessels.
- * Refractory earth.
- * Iron with hooks for making packages.
- * Iron hoops with their rivets for the same objects.

Copper wire, insulated with any material for electrical lighting, whenever the diameter of the wire, by itself, is up to No. 6 Birmingham measure, and the destination of the wire is shown.

Barbed wire, with staples for fencing.

Asbestos in powder.

Bars of steel, round or octagonal, for mines.

Cable of aloes or hemp, measuring up to 8 cm. of diameter or 3-10 mm.

Wire cable of iron or steel, of all thicknesses.

Iron or lead tubing, of all dimensions.

Knives, machetes, scythes, sickles, rakes, shovels, pickaxes, spades, hoes and mattocks of iron or steel for agriculture.

Crumbles, of all materials and sizes.

Emery in powder or in grain.

Sheet brass in plates up to 40 cm. in length by 30 in breadth, not stamped or painted.

Machinery and apparatus of all kinds, not specified, for manufacturing, agriculture, mining, the arts and sciences and their loose parts for repairs whenever these cannot be used separately.

Ore.

Roofing slate of from 2 to 3 mm. thickness.

Powder, wicks, fuse and explosive compounds for mines.

Clocks for towers and public buildings.

Changes in Dutiable Articles.

Steel, unwrought, net weight, new rate, 5: present rate, 7.

Iron, round in plates, &c., gross weight, new rate, 5: present rate, 7.

Lead in pigs, ammunition, &c., gross weight, new rate, 5: present rate, 7.

Iron furniture of all kinds, with or without marble covers, gross weight, new rate, 20: present rate, 25.

"Gross weight," as used above, signifies weight of goods with all coverings, boxes, &c.

"Net weight" signifies exact weight of article without the covering, bottles, &c.

This tariff will go into effect on July 1 of the present year.

Gogebie Gossip.

The newspapers in different parts of the country are being overrun with accounts of the marvelous profits made by those who have become identified with the Gogebie district in its earliest days. Often these tales are evidently related with the object of helping along the boom in all kinds of "wildcats," which undoubtedly infest the new region. Others apparently try to come as near the truth as possible. One of these accounts, in which a good deal of truth is seasoned with considerable fiction, has been printed in the *Akron Beacon*. From it we take the following:

The real discoverer of this region is not known. Old Dick Langford, the "Hermit of the Gogebie," claims to have known of the existence of iron for a quarter of a century. And yet he lives in poverty. Col. Charles Whittlesey, the eminent geologist, of Cleveland, announced the discovery of fine ore here as long ago as 1855. But no capitalist could be found to open up the new El Dorado. Twenty years ago a Pittsburgh syndicate searched the range for ore, but, as strange as it may seem, found none that they thought would pay to mine. The woods are full of "test pits" dug by these early explorers. The honor of a practical discovery is generally accorded to Capt. Nathaniel D. Moore, who made the lucky find by an accident almost. In 1873 he visited the region as a trapper and explorer, and on the roots of upturned trees, blown down by a great storm, he found what he believed was iron ore. He visited the region many times, carrying his provisions and traps on his back a distance of over 60 miles each time. It was 15 years after the discovery before he could induce capitalists to visit the region. The Lake Shore Road was completed and the first mine opened in 1885. This was the famous Colby, the greatest iron producer in the world, whose output last season was 250,000 tons. Early in its history Moore sold his interest in the Colby. It is stocked for only \$500,000, and its value is placed at \$5,000,000. Each original (\$25) is worth upward of \$500. This mine is literally a hill of iron, and as all Bessemer is a soft hematite, it is shelled into cars like so much sand. It has made scores of people rich and is now making fortunes for four sets of people—the owners of the ground, the owners of the mine, the lessees and the superintendent. The Colby and all other mines on this range are on ground leased from syndicates who own it. The ground owners get a royalty of 50 cents a ton on all ore removed. For instance, and to illustrate how so many people are getting rich off the Colby: Last year the ground owners received a total of \$125,000 royalty on the 250,000 tons of ore produced. Parties have the mine leased and pay its owners several dollars a ton for its product. The lessees sublet the work of getting out the ore to a Captain Sellwood for 80 cents a ton. Sellwood can mine the ore for 10 cents a ton, and thus clears 70 cents on every ton, or a total of \$175,000 last year.

A year or so ago, Captain Moore appeared in Milwaukee with samples of the Gogebie ore. He said he knew of ore mines equally as rich as the Colby. He visited nearly all the capitalists of Milwaukee, but could induce no one to go in with him. Finally he fell in with a shrewd Yankee insurance agent named John E. Burton. Burton listened to Moore and became interested. He visited the region and determined to try his luck. After mortgaging his home, converting everything he had into cash, and borrowing all he could from his friends, he had about \$10,000. With this he secured options on hundreds of acres around here, and purchased the site of Hurley. He immediately began organizing mines and selling the stock. At the start he found it pretty hard work.

Stock sold all the way from 75 cents to a few dollars a share. Burton purchased Moore's interest in several options, the Aurora among others. This hole proved to be a regular bonanza. Fifteen months ago Burton induced his friends to buy its stock at \$1 a share. Then as he began to make money, he bought the stock back, and kept buying until he had a controlling interest. Stock he sold for a few dollars a share he paid as much as \$20 for within a year. The capital stock of the Aurora was \$1,000,000, and a month ago he sold a controlling interest for \$600,000 spot cash, clearing \$400,000 on the deal. The new owners increased the capital stock to \$2,500,000, and in less than a month have cleared \$1,000,000 by the deal. Burton still owns a controlling interest in a dozen other mines, and the poor insurance agent of two years ago is now easily worth several millions. He is a bustling sort of a fellow, about 45 years of age. He is a native of New York, and his pointers have made scores of people rich about his old home in that State.

Captain Moore, who is a big, broad-faced fellow, is a millionaire. He is still largely interested, and with his partners is buying new mines whenever he can get them. Another man who was early in the field was H. S. Benjamin, of Milwaukee. A half-dozen years ago he ran a sewing machine agency, and then launched into the carriage business. A couple of years ago he made a bad failure in business. He became interested in the Gogebie shortly afterward, and is now a millionaire. He is the head of the Moore-Benjamin syndicate, with a number of mines under their control, and agencies in New York, Boston, Cleveland, Philadelphia, Chicago and other cities. His wife made \$60,000 by one lively deal last year. The Benjamins are warm friends of Ella Wheeler Wilcox, the poetess, and she has cleared \$5000 or 10,000 on a small investment last year.

Major F. A. Bates, a Cleveland man, now living in Milwaukee, is a member of the syndicate and he has grown very rich. There are scores of men in this place, Milwaukee and other parts of Wisconsin, who have made fortunes out of the iron mines, but Moore, Burton and Benjamin are the three most conspicuous examples. The Colbys, of Milwaukee, have made thousands, but they are also railroad owners and were wealthy before they became interested in mining. E. A. Hayes and J. P. Hayes were poor lawyers of Madison, Wis., a few years ago. They now own the controlling interest in the Germania and Ashland mines and are rich. The Rockafellers, of Cleveland, recently offered \$1,200,000 for the last-named mine, but the offer was declined. Two or three men in New York City paid \$20,000 for an interest in the Bessemer mine a year ago. Ten days ago they sold out to the Moore-Benjamin syndicate for \$250,000. A year ago Rev. A. A. Hoskins was the pastor of the Union Gospel Church, Milwaukee, at a salary of \$600 a year. He mortgaged his home, bought some stock, and to-day is one of the lucky ones, being worth considerable and owning a large amount of stock.

Of course these examples of fabulous wealth made in a few months' time have set the country wild. Of the 100 mining companies in existence in this range there are probably not one-fifth that will ever find enough here to pay for digging it out. The total output last year was 800,000 tons. This year it will be 1,500,000 tons; and yet there are only 12 or 15 mines now able to ship ore. As may readily be imagined, gigantic swindles are being perpetrated daily. Good and worthless mines are stocked alike, generally for \$1,000,000 or so each. Vast amounts of this stock have been sold all over the country. At least two-thirds of it will prove to be not worth the paper on which it is printed. Eastern capitalists are flocking to this wonderful region. Hundreds of thousands of dollars are being invested in mining stocks every week. A capitalist in one small place in Connecticut recently invested \$500,000 at one time. It is said \$1,000,000 of Cleveland money is invested in the Gogebie. There are a dozen, maybe 20, mines along the range that are very valuable, but outside of these the most of the wildcat stock, and there are cords of it, will prove worthless. Everybody in Milwaukee, the center of the stock dealing, is loaded with the stock, good, bad or indifferent. Clerks and young people in moderate circumstances and even sewing girls have invested their hard earnings in these stocks, and if there is ever a collapse the suffering will be fearful. If you contemplate buying stock be sure of one thing—be sure the company own a mine, and not merely an option to mine on somebody else's land.

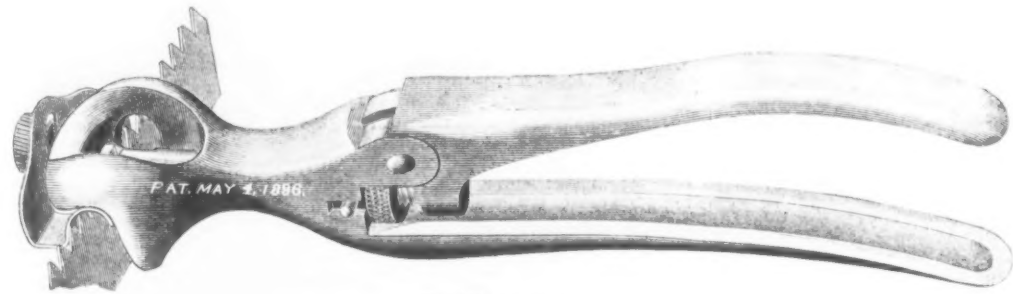
Quick Setting Cement.—According to the *Journal du Ceramiste et du Châfournier*, the maritime authorities at Boulogne have been using, since August, 1885, a quick-setting Portland cement, made by the French Cement Company, of Boulogne-sur-Mer. It has the appearance of Portland cement, and is made under similar conditions, and differs entirely from the Boulogne Roman cement formerly made. Laboratory experiments have shown that this cement, mixed with sea water at 63° F., sets in about 10 to 20 minutes. When used with gravel in the proportions of 1 to 1, or 1 to 2 of gravel, it sets in 30 and 90 minutes respectively. It is necessary to mix a small quantity at a time, and to use it at once. The composition of this cement is given as follows:

	Av. per cent.
Silicous sand	0.49
Combined silicon	23.62
Alumina	7.50
Peroxide of iron	1.96
Lime	62.54
Magnesia	0.98
Sulphuric acid	0.76
Loss in fire	2.07
Substances not analyzed	0.08
Total	100.00

Mr. N. C. Babbitt, of the Chester Rolling Mills, Thurlow, Pa., gives an account of the use by him of red lead to oxidize the manganese in iron and steel to permanganic acid, in a nitric solution. He states that he has used the method for the past six years in the chemical analysis of all grades of iron and steel, and occasionally upon spiegeleisen, with uniformly good results.

Ellrich Saw Set.

The Ellrich Hardware Company, of Plantsville, Conn., have just ready for the market the saw set illustrated below of the engravings. The cut is nearly full size, with the exception of the length of the handles. The tool is very simple in its parts. The

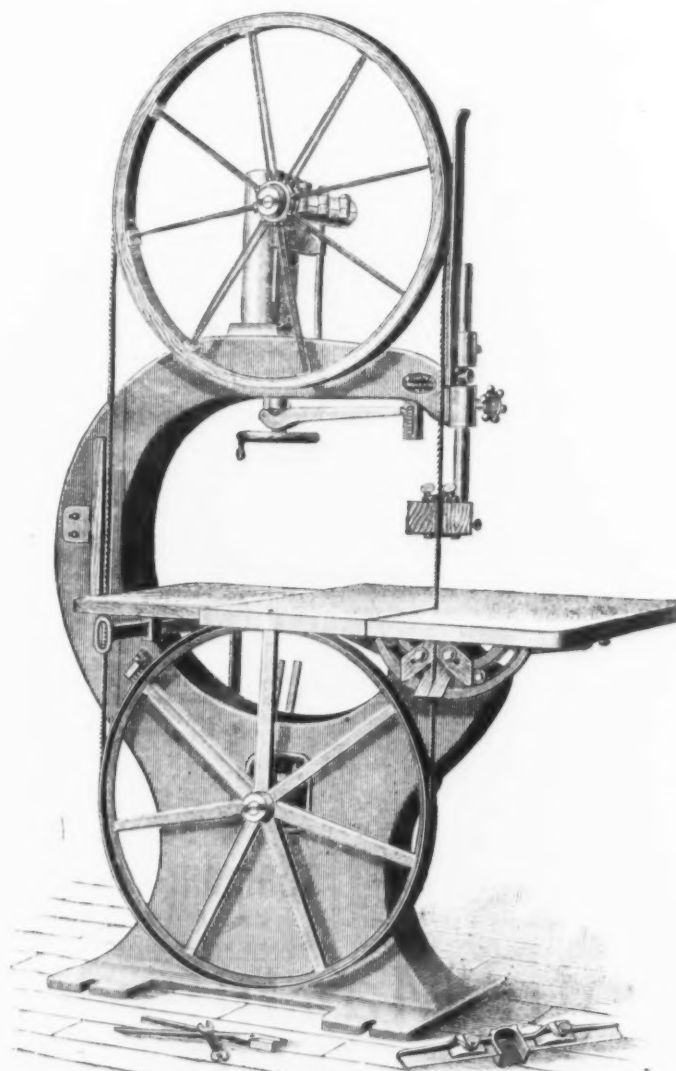


The Ellrich Saw Set.

set is driven forward by the leverage of the upper handle, while the position of the saw is controlled by a gauge, consisting of a piece of sheet brass bent over the front of the tool and controlled by the set screw shown at the left. This brass gauge is adjusted up or down, according to the length of the saw teeth and the distance the operator desires to set them from the point. The set or plunger can also be regulated by means of the thumb nut on its outer edge, immediately below the hung joint of the upper handle. This nut acts as a stop, making it impossible to apply more pressure to the saw teeth than is necessary to set them, and, inasmuch as it can be placed at any point desired, it is a very simple matter to regulate the tool so as to set the saw uniformly throughout.

Paint-Burning Device.

Messrs. Burtis & Lambert, of Lockport, N. Y., are putting upon the market a little tool for burning paint from the seams of tin roofs preparatory to soldering them in the work of repairing. We referred to this article without illustration some few weeks



Improved Band Saw Machine.

since, but now have the pleasure of presenting an engraving of it. It consists of a cast-iron square-shaped body, the bottom of which is of wire cloth, of mesh large enough to bring the coals against the roof, and yet retain the charcoal. The lid of the box slides endways, so that when the article is put in place it can be shut entirely, or a small space left open for the sake of promoting draft. A handle for lifting the tool is provided. In use it is rubbed



Paint Burning Device.

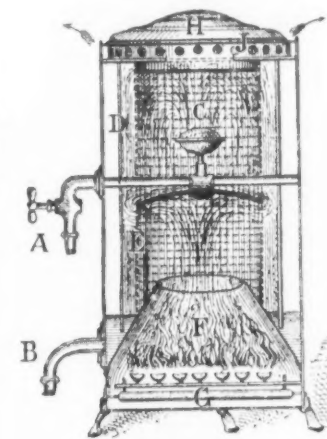
over the seams that are to be repaired, the heat having the effect of burning away the paint, thus preparing the seam for soldering without damaging the metal or losing the tinned surface by scraping, as is usually the case. A seam that is scratched in the usual way is difficult of satisfactory repair, and this device would seem to provide a means by which many difficulties are overcome. Tanners dislike soldering old roofs, and as a consequence unsatisfactory work is not unusual. The bills rendered to customers for

this reason are not very generally acceptable. The use of this tool, the makers claim, obviates many of the unpleasant features about repair work, and makes repair bills more reasonable accordingly. The incidental advantages are economy of fuel and saving of labor. The device can be used to heat soldering irons on a small job if no fire

gases, so that the cold water, entering by the cock A, is projected by the rose C on the wire gauze E, and falls down in the form of fine rain—that is to say, in a condition highly suitable for mingling intimately with the hot gases rising from the furnace. The water is heated either by direct contact with the hot gases or by contact with

New Band Sawing Machine.

Frank H. Clement, 131 Mill street, Rochester, N. Y., has added to his extensive line of wood working machinery a new band saw, which embodies several new features that have been suggested by practical experience with this class of tools. It is claimed for this machine that it is especially desirable in shops in which a great variety of work is done, and where there is frequent changing from narrow to wide blades. In all such cases it is essential to have the upper wheel very light and nicely balanced. On the other hand, the lower wheel will give better results when it is reasonably heavy. Accordingly, in the present machine, the upper wheel is built with steel arms, set bracing, and the rim is made from the best dried white pine glued up in thin segments and screwed through and through at the joints. By this construction the smallest possible weight is obtained with the greatest possible strength. All the arrange-



A German Bath Heater.

interruption. Both the quantity and the temperature of the water heated may be regulated by the supply cock, the temperature varying from 60° to 120° F.

Lateral Adjustment for Plane Bits.

The Stanley Rule and Level Company, of New Britain, Conn., and New York office at 29 Chambers street, are directing attention to a new attachment for adjusting plane irons sideways for the purpose of setting the cutting edge exactly square with the face of the plane, shown in the cut. The lever just under the plane iron enables the workman to regulate his cutter, and to set it as may be desired by the nature of the work to be done, or the way in which the bit has been ground. This is so arranged as to be out of the way for the other adjustments which are provided on the better class of iron plate at the present time. We understand that this device for side adjust-



Stanley's Lateral Adjustment for Plane Bits.

ment is attached to all the Bailey iron planes and Bailey wood planes shown in the catalogue of the company with two or three minor exceptions.

Mr. W. H. Bailey, of the Republic Iron Works, Pittsburgh, Pa., has been granted a patent for a steel furnace bottom, concerning the operation of which good reports come from Mr. C. Snively, manager of the American Iron and Steel Works, Pittsburgh; W. T. Graham, of Bridgeport, Ohio; N. Lloyd, Sons & Co., of Pittsburgh, and the Republic Iron Works. In the place of the old coke bottom, which injures the steel-iron easily, Mr. Bailey has a 10-inch combustion chamber at the back, from which the gas enters the flues, eight inches wide and about six inches deep. The bottom and the flues are covered with 12 x 24 inch common hard, fire brick tile.

A license of incorporation has been issued to the Merchants' and Manufacturers' Association, of Chicago. Incorporators, Robert Hill, Louis Wampold, Morris Selz, Henry W. K. Cutter and Henry J. McFarland. The purpose is stated to be the protection and extension of the mercantile and manufacturing interests of the city of Chicago and its vicinity.

WASHINGTON NEWS.

(From Our Regular Correspondent.)

WASHINGTON, D. C., April 12, 1887.

The Interstate Commerce Commission have already received from railroad corporations and manufacturing establishments a mass of raw material in the way of schedules of rates, protests, inquiries and suggestions, but owing to lack of clerical force and suitable quarters they have not been able to examine or tabulate the papers so as to make them available even for their own use. The commission have engaged quarters, which will be at their disposal on Friday of the present week. On that day they will hold a meeting and doubtless select a secretary and appoint a force of clerks for their immediate requirements and get down to work. The commissioners realize that the provisions of the act are causing considerable uncertainty and embarrassment throughout the country, and are desirous of formulating some preliminary plan of operations, so that the public may have a general idea of their methods of procedure and policy in the direction of their delicate duties. The commissioners are evidently determined to move cautiously and to act conservatively until they find out from experience how far they can go, and whether the scheme of Government regulation of railroad traffic is feasible under the present system, or can be made so by amendatory legislation, based upon the results of their labors in attempting to carry out fully or approximately the spirit and letter of the act.

The suspension of the long and short haul provisions is regarded as a concession on the part of the commission that this important feature of the act is not a very safe subject to tangle with. These provisions, with the pooling, are the vital features of the act. The suspension is, therefore, reassuring to the roads, as it indicates that the commission, in handling the questions before them, are determined to keep on the safe side. As soon as they become fully organized they will be able to go over their papers and see where they stand.

THE STEEL FOR THE NEW NAVY.

Commander Robley D. Evans, chief inspector of steel for the new cruisers, is receiving almost daily letters from the officers detailed for duty under him, speaking in the highest terms of the character of steel being cast for the use of the new vessels for the Navy. The official announcement of the highly successful result of the attempt at Thurlow, Pa., to cast the steel stem for the new cruiser Baltimore, building at the Cramp yard, Philadelphia, was received with great satisfaction in naval circles. The mass, weighing over 15,000 pounds, is reported without a defect. This, for a first effort, was regarded not only as marvelous, but as a promise of great superiority of material from the American establishments engaged in this class of work. The casting just made is reported to the department as the best work of the kind ever produced in the United States.

A letter from Lieutenant Gilmore on similar duty on the Pacific Coast gives equally flattering accounts of the material turned out by the Union Iron Works, of San Francisco, for the cruiser Charleston, which they have in hand. Lieutenant Gilmore claims that the steel is as good as that made on the Atlantic Coast, if it does not surpass it. Commander Evans, who has just visited the Baltimore, at Cramps, speaks of her steel frames as equal to any that have ever been put in any ship.

PLENTY OF WORK AHEAD.

The Secretary of the Navy, speaking of the future, said to-day: "We have now under way an amount of work in shipbuilding and ordnance fabrication which will last five years. But we wish to add to this. We have facilities for more than quadrupling the work we are now doing, and we must go ahead. Who can tell what complications may arise in the Fishery question alone? I hope the next Congress will fully double the authority it has given for new ships. Within the next two to five years we should have at least 20 new ships, gunboats and monitors of the largest and latest patterns afloat as the result of present acts. If the next Congress doubles this, we will begin to have something to show for a navy, and one without a rival in the latest floating engines of war."

COMPLETING THE FIRST CRUISERS.

The little flurry in the fishery controversy has led the Secretary, on the very proper plea of settling the accounts with the contractors, to an order to complete the work on the Atlanta, Boston and Chicago. In a letter to the chiefs of the Bureau of Construction and Steam Engineering, and to the assignees of Mr. Roach, the Secretary commands: "It is therefore directed that the work now going on at Chester, Pa., in and toward the completion of the Chicago, be continued and prosecuted at that place with all the speed compatible with its proper performance and until the contract work is completed; that only such extra work as is essentially necessary to prepare the vessel for her first trial shall be done at present and that all other extra work heretofore ordered, or which may be contemplated as an improvement on the existing plans and specifications, be postponed until further orders; that, before leaving Chester, the Chicago shall be so far completed, under the contract, as not to require any work to be done on her after her arrival at the Navy Yard, New York, and preparatory to her first six hours' trial, except to place on board the weights necessary to bring her to her contemplated mean draft (10 feet), and that, so soon as the machinery is in proper condition, such trial shall be had at such time and place as the department may designate. The same general instructions, so far as the same are appropriate and necessary, will also govern the further prosecution of unfinished work on the Boston and Atlanta."

MORE PROPOSALS INVITED FOR VESSELS.

The shipbuilders of the United States are given another chance, under invitations for sealed proposals for building five additional vessels, three cruisers and two gunboats, for

the Navy. In the list is the Newark, a 4000 ton cruiser, authorized by act of March 3, 1885. At the first opening last year, the lowest bid exceeded the limit of cost, \$110,000. Congress increased this limit to \$1,300,000. Proposals for the construction of this vessel are again asked. The additional cruisers, Nos. 4 and 5, and all their parts are to be of domestic manufacture, to have a maximum speed of 19 knots an hour, and for every quarter of a knot above, \$50,000. The two gunboats designated as Nos. 3 and 4, are to be 1700-ton vessels of the type of the gunboat now building at Cramp's works, in Philadelphia. The three cruisers must be completed within 24 months, and the two gunboats within 18 months from the execution of the respective contracts. The cost of cruisers No. 4 and No. 5, including equipment, but exclusive of armament and premiums for speed, is limited to an aggregate for both vessels of not more than \$3,000,000. The cost of gunboats No. 3 and No. 4, exclusive of armament, but including equipment, is limited to an amount not exceeding \$550,000 each.

A NEW SCHEDULE OF TESTS OF SPEED.

Secretary Whitney is now considering several plans proposed by chiefs of bureaus for the test speed of new vessels when completed. They are a great improvement on the old methods, but are not entirely free from the criticism of too much test on technical and not enough on the practical merits of the vessel.

THE NAVAL GUN FOUNDRY.

The modified plans for the conversion of the Washington Navy Yard into a naval arsenal, including a gun foundry for the fabrication of guns of heaviest caliber, have been approved by the Secretary of the Navy, and make a saving of \$100,000 in buildings. For some time the Government has had facilities for the fabrication of 6 and 8 inch steel guns. The Secretary sees no use in tearing down these buildings. He is not inclined to waste too much time on preliminaries. He is determined to utilize what conveniences exist and add what may be necessary without tearing down and rebuilding.

A High Priced Keg of Nails.

In W. M. Kerr & Co.'s show window is a keg of nails. The blue letters on the head of the keg read: "The Wellston Nail, 8 penny steel, Wellston, Ohio." That keg of nails has a history. It is this: A year ago last summer when John B. Hastings was agitating the question of building a nail mill at Wellston, the matter often drew crowds together, on the street corners, to discuss the probabilities of the enterprise. That was the time when the nail mill strike was at its height, when the "ifs" and "buts" were mixed up generally with the nail situation. Through it all, though, Mr. Hastings pushed his Wellston project with various streaks of fortune. He never lost heart. Success always gilded the mountain tops of his prospects. He was always happy and hopeful and always with a cheerful word for every one he met.

One day there was a knot of nailers gathered on the corner of Second and Center discussing the situation, and Mr. Hastings was in the midst of them explaining the enterprise and painting with tinted words the general outlook. The crowd around listened with interest, some doubting, some objecting and some asking questions. As the crowd stood thus engaged, W. M. Kerr came along. Now, everybody knows what it is for Kerr to come along. It means a pleasant joke, a witty remark or a friendly banter. Now, Mr. Kerr was not overburdened with faith in the Wellston enterprise, so, knowing they were talking about it, he stepped into the crowd, and said: "Brother Hastings, just book me for the first keg of eight pennies from your Wellston mill, and charge me \$50 for it." This banter created a laugh, but Mr. Hastings said "all right—that's a bargain—the nails will get here," and Mr. Kerr kept on to his store, thinking no more about it.

But now the most interesting part of the affair transpires. Last Friday came a keg of 8 penny nails from Wellston, accompanied by a letter containing a bill of lading and a bill reading "W. M. Kerr bought of Wellston Nail Company—one keg 8 penny nails, \$50." Mr. Kerr opened his eyes when he saw the bill, but he declares it is a true bill.

and there is no getting out of it. He has it to pay, and he will do it without squinting, but he vows it is the biggest price he ever paid for nails in his life. "Just say to the farmers," he remarked to the reporter, "the keg is at W. M. Kerr & Co.'s hardware store, and have 'em come in and get a few for seed—they are too precious for common consumption."

The records of the *Railway Age* show that, from January 1 to April 1, no less than 1040 miles of new main track have been laid on 49 different lines in 25 of the States and Territories. This is a larger total than we have recorded for any previous year up to the same date, excepting in 1882 when the construction for the entire year reached the unprecedented total of 11,568 miles. The mileage already laid in the three most unfavorable months of the year is greater than that added in any one of several years during the history of this country, and is only 700 miles less than the total new construction in the year 1875. If the record of recent years forms a basis for estimate, the work of the past three months would seem to indicate that the tracklaying for the year 1887 will aggregate from 8000 to 10,000 miles.

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Adamant Powder.

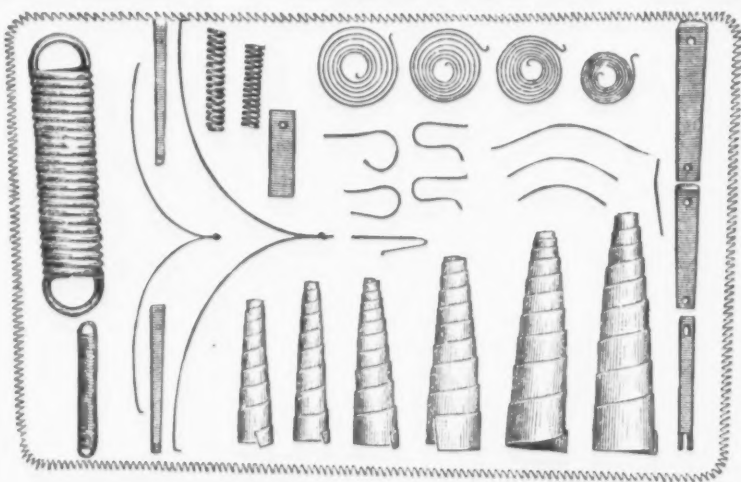
A new and unexcelled invention for hardening metals and especially Iron and Steel of all kinds. Patented lately and in use in Germany, England, Belgium and patent applied for in U. S.

We are introducing the Adamant Powder in this country and have no doubt that this article, which is easily applied and produces a nearly impervious metal, will quickly gain favor with all who use it. For the convenience of those who wish to test it, we have put up cans of about 35 pounds, which we will send for \$1.00. For particulars apply to

Adamant Powder Co.,
174-176 Pearl St., N. Y.

Sole Agents for U. S. and Canada.

Sabin Machine Co.,



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SPECIAL SPRINGS FOR MACHINERY

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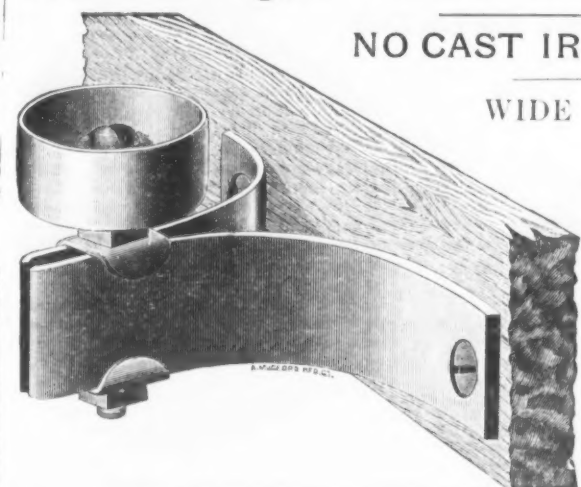
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Neat,
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JACKSON'S

(Latest Patent)

IMPROVED

Sectional Curb Churn.



We are now, and shall hereafter, devote the whole of our works to the manufacture of our New Patent Churns. The increasing demand for them compels us to adopt this plan. Our patent improvements consist (as shown in the cut) of securing the curb to the churn with a chime and krose in a similar manner to that of holding the head in a barrel, thus preventing all possibility of coming off or loose; avoiding all cracks or places for the accumulation of sour milk.

Our Churns are made of the best quality of White Oak, thoroughly kiln-dried, and we use galvanized hoops which will not rust.

These Churns are turned in a lathe both inside and out, by special machinery. No pains are spared to maintain the high reputation of the Jackson Churn, which has been on the market for over thirty years. With the improved facilities, we are able to furnish our Churn to the trade as low as many inferior makes can be purchased. All our Churns are warranted to give satisfaction. Send for our price list.

This advertisement will appear monthly in *The Iron Age*.

J. M. JACKSON, Agent

(Successor to A. F. JACKSON & SON),

MILLPORT, CHEMUNG CO., N. Y.

HUGUNIN Improved Patent SASH BALANCES.

All genuine Improved Screw Balances have "Robt. B. Hugunin, Patentee and Solely Authorized Maker" cast direct on the faces, by which they are instantly known—and upon which all other Balances are counterfeited in gringements.

Important Caution to the Trade and Users throughout the U. S.

13 U. S. patents were granted R. B. Hugunin and he originated and patented every feature of the Screw Balance—hence no one else has ever had a patent on any part of it—but, these goods, like good money, have been counterfeited. The counterfeiter, to deceive the dealer and user into the belief that he has a right to make these goods, gives his own name to the counterfeiter by the date of one of Hugunin's minor patents—Nov. 6 1877—never used on the genuine—thereby, in addition, committing a glaring fraud on the U. S. patent office, the dealer, user and inventor—as well as the public.

Fitted out as above—circles are sent out with which, and canvassing on the fly, misrepresents, etc., &c., dealers and users are caught in the trap, and set at work in the interior of the sales of his property—and placed in the position of rendering themselves and customers sure liable to payment of damages for infringement. A roller cam mechanism, Balancing Sash by automatically controlled friction. For medium and lighter sashes, widths, 15 in., 18 in., 24 in., 30 in., 36 in., 42 in., 48 in., 54 in., 60 in., 66 in., 72 in., 78 in., 84 in., 90 in., 96 in., 102 in., 108 in., 114 in., 120 in., 126 in., 132 in., 138 in., 144 in., 150 in., 156 in., 162 in., 168 in., 174 in., 180 in., 186 in., 192 in., 198 in., 204 in., 210 in., 216 in., 222 in., 228 in., 234 in., 240 in., 246 in., 252 in., 258 in., 264 in., 270 in., 276 in., 282 in., 288 in., 294 in., 300 in., 306 in., 312 in., 318 in., 324 in., 330 in., 336 in., 342 in., 348 in., 354 in., 360 in., 366 in., 372 in., 378 in., 384 in., 390 in., 396 in., 402 in., 408 in., 414 in., 420 in., 426 in., 432 in., 438 in., 444 in., 450 in., 456 in., 462 in., 468 in., 474 in., 480 in., 486 in., 492 in., 498 in., 504 in., 510 in., 516 in., 522 in., 528 in., 534 in., 540 in., 546 in., 552 in., 558 in., 564 in., 570 in., 576 in., 582 in., 588 in., 594 in., 600 in., 606 in., 612 in., 618 in., 624 in., 630 in., 636 in., 642 in., 648 in., 654 in., 660 in., 666 in., 672 in., 678 in., 684 in., 690 in., 696 in., 702 in., 708 in., 714 in., 720 in., 726 in., 732 in., 738 in., 744 in., 750 in., 756 in., 762 in., 768 in., 774 in., 780 in., 786 in., 792 in., 798 in., 804 in., 810 in., 816 in., 822 in., 828 in., 834 in., 840 in., 846 in., 852 in., 858 in., 864 in., 870 in., 876 in., 882 in., 888 in., 894 in., 900 in., 906 in., 912 in., 918 in., 924 in., 930 in., 936 in., 942 in., 948 in., 954 in., 960 in., 966 in., 972 in., 978 in., 984 in., 990 in., 996 in., 1000 in.

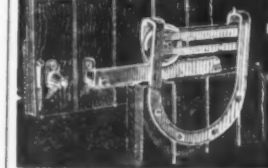
counts to the trade. ANNEALED GRAY IRON, SET 4. No. 3, 570. No. 2, 640. No. 1, 800. No. 3, 650. No. 2, 800. No. 1, 900. Take notice, the above cut shows the genuine Screw Balance—no part of which can be used as shown without infringing, and infringement will be prosecuted. For sale by the best trade. Address orders, &c.,

ROBERT B. HUGUNIN WINDOW FIXTURE MFG. CO., Hartford, Conn.

LANE'S PATENT STEEL DOOR HANGER.

The most perfect Anti-Friction Hanger in the Market.

BECAUSE



It is made of steel throughout, except the wheel which has a steel axle. It will not break. It is practically free from wear. It is almost noiseless in action. It requires no oil. It has a broad bearing on the door, and keeps in line. It is by far the most durable. It may be used with any track. It is always in order.

LANE'S PATENT TRACK

Is made of steel and is easily put in position. Catches and holds no snow or ice. Door hung thereon cannot jump the track. Is not subject to decay. It requires no fitting, but is ready at once. May be used with hangers of other manufacture.

Manufactured by **LANE BROS.,** Poughkeepsie, N. Y.
JOHN H. GRAHAM & CO., General Agents. 113 Chambers Street, NEW YORK.



Sebastian, May & Co.'s IMPROVED FOOT and LATHES POWER

Drill Presses, Shapers, Bands, Circular and Scroll Saws, Machinists' Tools and Supplies. Lathes on trial. Catalogue mailed on application.

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SALEM LEAD CO.,

—MANUFACTURERS OF—

PURE WHITE LEAD, Lead Pipe and Sheet Lead.

SALEM, MASSACHUSETTS.

FOR FINE CUTS SEND TO KYES & WOODBURY, ENGRAVERS WORCESTER, MASS.

MECHANICAL.

A Case of Low Water in a Steel Boiler.

In a paper published in the last volume of "Proceedings of the Engineers' Club," of Philadelphia, Mr. J. E. Codman refers to a very interesting case of low water in a steel boiler. The boiler, which had been in constant use for about two and one-half years, was 11 feet 6 inches diameter, 10 feet 10 inches long, contained two furnace flues 3 feet 6 inches diameter, 8 feet long, and 188 3-inch tubes 7 feet long; the grate bars, bridge walls and flues were all inside the furnace flues. Back of the furnace was a combustion chamber 26 inches deep, the crown, sides and bottom of which were corrugated with corrugations 5 inches deep. No stays or braces were

that steel plates for boiler use, as at present manufactured, are capable of standing a good deal of rough usage, either from carelessness or accidents.

Effects of Slack in Freight Trains.

An interesting and important series of experiments relating to the effect of slack in freight trains were recently made on the Iowa division of the Chicago, Burlington and Quincy Railway. They were presumably made partly on account of the bearing of the facts and theories involved in the competitive trials of rival continuous freight-brake systems. Of the results of these tests, the *Chicago Railway Review* of April 2, which gives a detailed account of them, says that they "make it more than ever certain that close coupling must be eventually used in freight as well as in passenger trains."

permit of nice adjustment. The Judson governor is used with speeder, by which the speed of the engine can be altered 15 to 20 per cent. while running. The cylinders of the $\frac{1}{2}$ and $\frac{3}{4}$ horse power engines are 11 $\frac{1}{4}$ and 2 inches in diameter respectively, length of stroke, 3 and 3 $\frac{1}{2}$ inches; speeds 450 and 400 revolutions per minute; weights, 225 and 250 pounds, and floor space required, 20 x 24 and 24 x 24 inches. The $\frac{1}{4}$ horse-power engine is of different design from the above, being of the single-crank disk type, and without governor. The cylinder piston is packed and all the boxes are provided with gibs. The engine is fitted with a feed pump and heater. The cylinder of the $\frac{1}{4}$ horse-power engine is 1 $\frac{1}{2}$ inches in diameter; stroke, 2 $\frac{1}{2}$ inches; speed, 500 revolutions per minute; weight, 75 pounds, and floor space required, 10 x 16 inches. The above engines are rated

tient will be the pressure in pounds per square foot.

Table of Wind Velocities and Pressures.

Velocity in miles per hour.	Velocity in feet per second.	Pressure in lbs. per square foot.	REMARKS.—Character of wind, &c.
1	1.47	.005	Hardly perceptible.
2	2.93	.02	Pleasant.
3	4.40	.045	
4	5.87	.08	
5	7.33	.125	
10	14.67	.5	Fresh breeze.
15	22	1.125	
20	29.33	2	
25	36.67	3.125	Brisk wind.
30	44	4.5	Strong wind.
40	58.67	8	High wind.
50	73.33	12.5	Storm.
60	88	18	Violent storm.
80	117.8	32	Hurricane.
100	146.7	50	Violent hurricane, uprooting large trees.

The Cary Revolving Piston Pump.

The Cary Mfg. Company, of Fairhaven, Mass., are putting on the market an ingenious form of revolving piston hand pump, of which we present engravings. The pump proper is without packing or valves, and little difficulty is hence encountered in operating it.

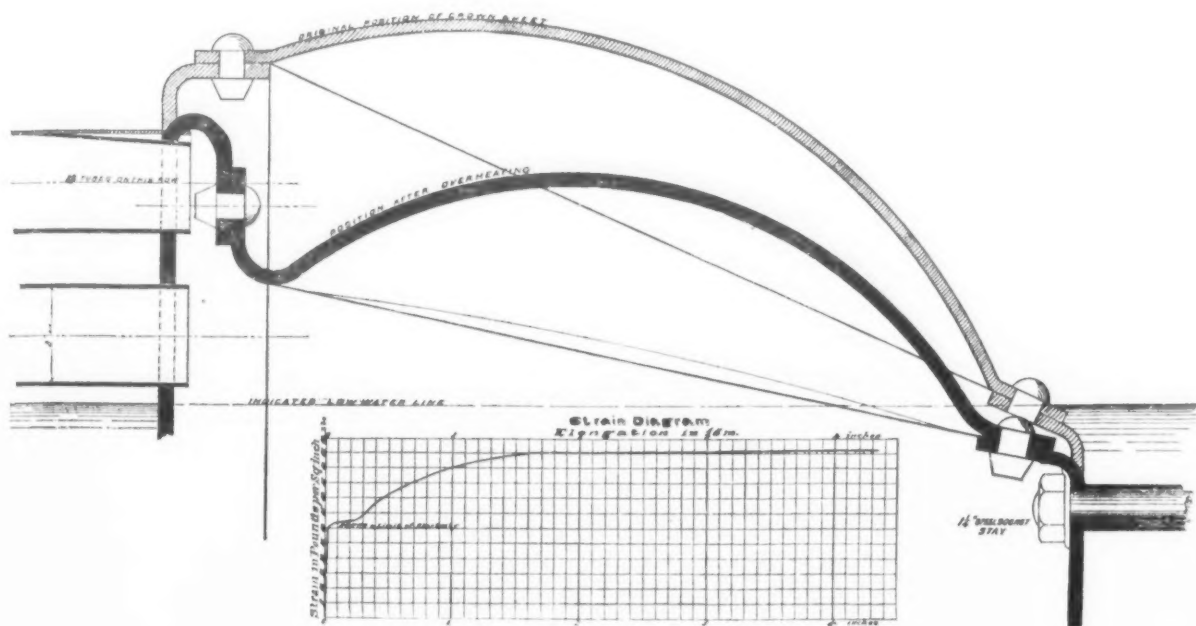
Fig. 1 represents a sectional view of a deep-well pump. The capacity of this pump at 80 revolutions per minute (which is found to be the average number a person will make in using it) is about 7 $\frac{1}{2}$ gallons, or 450 gallons per hour, and that of the common force pump, shown in Fig. 2,

considered sufficient to prevent freezing in this climate. If, however, there should be any fear of freezing the water can be driven out to the level of the suction trap by simply turning the crank backward. The pump will not require priming to use again. In Fig. 2 E is an eccentric, rigidly attached to the head of the cylinder C C C C; R R R R is a revolving head attached to the shaft S at its bearings; A A and B B are the pistons which cross each other and are carried into the revolving head as shown.

In the common pump the water enters through the suction pipe directly, while in the deep-well pump it enters, as we have shown, through a special trap. The working of the pistons by turning the crank will be readily understood from Fig. 2. As there are, in effect, four pistons, the flow of water is practically continuous. The common force pump, shown in Fig. 3, is made with either an iron or a brass revolving head. This pump has a practical lift of 26 feet, and has a good force. It is tapped for 1 $\frac{1}{4}$ inch suction pipe. It is not absolutely a non-freezing pump, but it is provided with a small trip valve or cock near its base, which can be turned to allow the water to remain in or run out of the pump. Of course, when the valve is open the water must be raised from its level, and it will take a trifle longer to pump it than when it remains in the pump.

A Large Passenger Locomotive.

The Strong Locomotive Company, of New York, have contracted to supply some large passenger locomotives to a Western line. The engines will be of the American type, with a rear pony truck, and will have the Strong valve-gear and the Strong form of locomotive boiler, the ordinary fire-box



A CASE OF LOW WATER IN A STEEL BOILER.

used to support this portion of the boiler, the corrugations being sufficient to strengthen this part to withstand the external pressure. The sketch shows a section of the combustion chamber through the crown sheet, and the position of the plates before and after overheating F. The highest point in the combustion chamber was 3 $\frac{1}{2}$ inches above the top of the upper row of tubes. The water line in the boiler was carried 9 $\frac{1}{2}$ inches above the top line of tubes, making 6 inches of water over the crown sheet of combustion chamber to center of middle gauge cock. The gauge cocks were 4 inches apart, and with water shown in low gauge cock there were 2 inches of water over the highest point of corrugation in the crown of combustion chamber. Fusible plugs were placed at those points to give timely warning of low water. The glass gauge showed water about 1 inch below the bottom gauge cock. The steel plates used in the construction of the boiler were all subject to a rigid test and inspection. The tests were made at the United States Arsenal, Watertown, Mass.

The material showed the following properties: Tensile strength average, 53,000 pounds per square inch of section, elongation 31 per cent. in 15 inches, and 50 per cent. contraction of area. The accompanying sketch shows the strain diagram of the material. During the past summer the boilers were used to their full capacity night and day. By some oversight the water was allowed to fall below the upper row of tubes, exposing the crown sheet of the combustion chamber to the direct action of the fire with no protection whatever, and a steam pressure on the boiler of 60 pounds by gauge. The effect of this was to heat the plates composing the crown sheet, also the flange of the tube sheet to a high degree of temperature. An inspection of the boiler indicated that the water must have been near the bottom of the second row of tubes from the top. This water line was quite distinctly marked on the sides of the boiler. The steel tube sheet is $\frac{1}{2}$ inches thick, and flanged to the crown sheet and supports it at this side.

The back flange of crown sheet was riveted to the back sheet of combustion chamber, which was secured to the outside shell by 1 $\frac{1}{4}$ -inch socket stays with nuts and washers on both ends. This connection was partly exposed and overheated. The sheets on examination indicated by every appearance that the material had been exposed to a high temperature. The fusible plugs were all melted out. The effects of heating the plates and the pressure of 60 pounds of steam on the outside was to force the crown sheet down by the yielding of the tube sheet until the rivet heads in the flange struck the tube ends, the flange at the back connection following as far as the upper row of stays would allow it to bend over, and being under water the strain could not pull the heads through. The corrugations did not change their form to any great amount, and remained intact. Those in charge of the boiler, not fully realizing how low the water was in the boiler, put the feed pump on and filled the boiler almost immediately up to the regular water-line. This of itself would be considered a pretty severe strain on any material, but with steel plates it seems almost incredible that the plates did not crack. Owing to the leaking of the tubes and the quantity of water flowing from the fusible plugs it was considered advisable to shut the boiler off and draw the fires. On examining the sheets, it was found that the tube sheet showed no signs of cracking. It was taken out, the flange bent back into position, and it is now working at the usual pressure of 60 pounds as good as ever it was. From the severe test this material stood, it seems

Every witness of the tests left the ground thoroughly satisfied that the present slack in the link-and-pin coupling must be eliminated in the interest of economy and of safety. The experiences had with the loose coupled trains, rough as they were, were not thoroughly indicative of what is met with in every-day service, for there was no question but that the train men, in face of instructions to the contrary, handled those trains very much as they might if on dress parade. This was well understood, and only served to heighten the impression made by the smooth action of the close coupled train, which was handled even more roughly than it would be in ordinary service."

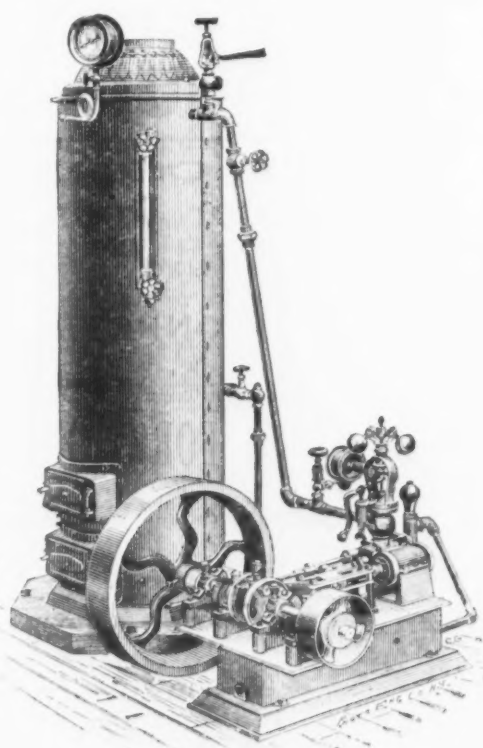
Steam Engines of Fractional Horse-Power.

O. J. Miller, Bergen, N. Y., builds steam engines of $\frac{1}{4}$, $\frac{1}{2}$ and $\frac{3}{4}$ horse-power. The cut illustrates the latter two sizes connected with upright boiler. The engines of $\frac{1}{2}$ and $\frac{3}{4}$ horse-power have center cranks, as shown. The wrist-pins are fitted with self-feeding oilers, as are also the babbitted pillow blocks, of which there are four, with caps at an angle of 45°. The cylinder is

at 50 pounds boiler pressure, and are built to gauge, so that parts can be readily duplicated when required. The boilers made by Mr. O. J. Miller, to go with these engines if desired, are of charcoal iron, and are surrounded with a fire jacket. They are of the vertical tubular type, with hand-holes in the top and bottom head so situated that the flues can be scraped lengthwise and the flue-sheet at the same time cleaned and examined. The smoke hood is double, with a damper, so that when steam is up the damper on the inside hood can be closed, making it a one-half return flue boiler. The boilers are tested at 160 pounds cold pressure, and are rated at 80 pounds working pressure. They are provided with all the necessary fixtures and are ready to start when filled. Their heights are 57, 58, and 60 inches; diameters of boiler shell, 10, 12, and 14 inches; weights, 275, 375, and 400 pounds, and floor space occupied, 24 x 24, 28 x 28, and 30 x 30 inches.

Wind Velocities and Pressures.

In an interesting article on the stability of chimneys, published in the *Locomotive* some time ago, we find a convenient table



ENGINE AND BOILER, BUILT BY O. J. MILLER, BERGEN, N. Y.

also provided with a lubricator. The wrist-pins have gun-metal boxes, and all boxes are fitted with gibs to take up wear. The piston-rods, shafts, valve-rods and guide-bars are of steel, and all stuffing glands are made of steam metal. The pump, which is of large capacity, is run by an eccentric on the main shaft, the pump piston being made of gun metal. The bed of the engine contains a feed-water heater, in which the water is raised nearly to the boiling point by the exhaust steam from the engine. The cross-head is said to be of an entirely new design, and the connecting-rod at the cross-head end runs on conical steel pins, which

of wind velocities and pressures, which we append. The relation between the velocity of the wind and its pressure against flat or curved surfaces opposed to it is not very well understood. Proper experiments to determine it exactly have never been made, although it would appear that there is no great difficulty involved in making such experiments at the present time. The pressure is generally supposed to increase as the square of the velocity when the opposing surface is at right angles to the direction of the wind. In such cases Smeaton's rule is to divide the square of the velocity in miles per hour by 200; the quo-

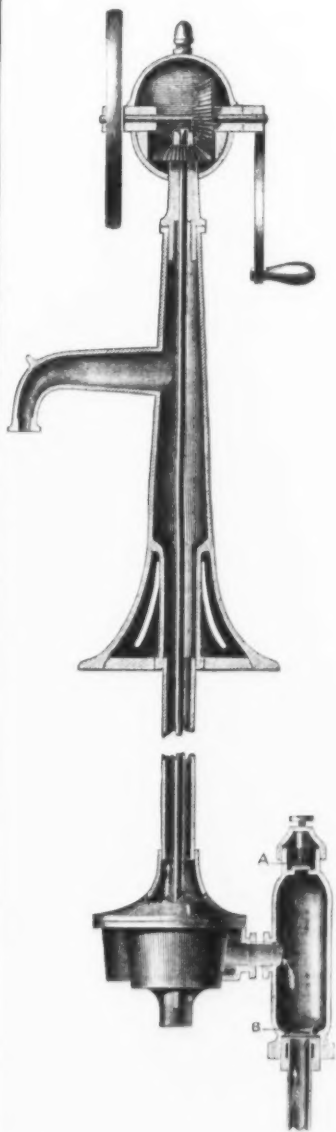


Fig. 1.—Vertical Section of Deep-Well Pump.

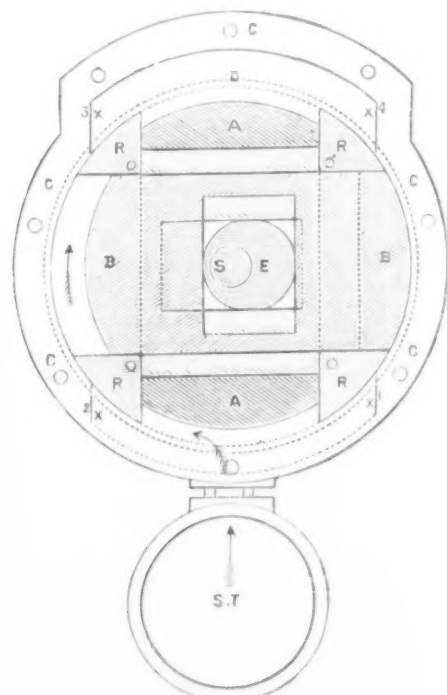


Fig. 2.—Horizontal Section of Pump Proper.



Fig. 3.—Common Force Pump.

THE CARY REVOLVING PISTON PUMP.

Made by the Cary Manufacturing Company, Fairhaven, Mass.

3, about 5 gallons, or 300 gallons per hour. These figures, we are told, represent the actual capacity of the Cary pump in its ordinary use. But in comparing this capacity with that of brake pumps, it must be remembered that the Cary pump must make its full stroke and deliver its full practical capacity at every revolution; while, in the brake pump, it is seldom that the full stroke is made in practice, for the arm will get tired and shorter strokes will be made than the full swing of the brake. Therefore the actual practical capacity of the brake pumps is much less than appears by the figures usually given. Again, it is far easier to increase the number of revolutions of the Cary pump than to increase the number of strokes in the brake pumps, and thus the capacity can be greatly increased more easily in the former than in the latter.

The working parts of the pump are shown in Figs. 1 and 2, the latter representing a horizontal section of the pump proper.

The motion is transmitted from the crank to the pumps by means of two simple gears and a connecting rod; S T (Fig. 2) is a suction trap attached to the pumps proper; B (Fig. 1) in the suction trap is an ordinary check valve; A is a valve for regulating the height of water in the pipe. The valve A is adjusted so as to keep the water in the pipe at a level 4 feet below the surface of the ground, but by screwing this valve down or up the water will stand higher or lower in the pipe as may be desired. Four feet is

being superseded by two corrugated flues and a combustion chamber. The leading dimensions of the new engines will be as follows:

Cylinders, 19 by 24 in.
Driving-wheels, diameter 68 in.
Weight in working order, estimated 116,000 lbs.
Boiler, diameter of shell 58 in.
Corrugated flues, length and diameter each 7 ft by 12 in.
Heating surface, 234 flues, 2 in. diameter, 10 feet long 1200 sq. ft.
Grate area 50 sq. ft.

The boiler will be made at the Continental Iron Works, Brooklyn, and will be tested to 300 pounds per square inch. All the plates will be of steel $\frac{1}{2}$ inch thick, and welded at the joints. The process of corrugating the flues will reduce the thickness of the plates after corrugation to about $\frac{3}{4}$ inch. The working boiler pressure will be 175 pounds per square inch, and it is anticipated that an average pressure on the piston of 80 pounds per square inch can be maintained at a considerable speed. If this expectation is realized, the engine will be able to indicate over 1300 horse-power at a speed of 50 miles per hour, a feat that has probably never been performed by any locomotive.

The Adamant Powder Company, of New York, are introducing a new article for hardening metals, and especially iron and steel, when it is desired to make them nearly impenetrable. We have been shown specimens of iron hardened by the powder.

"PENNSYLVANIA."

BEWARE OF IMITATIONS.

The great and unprecedented success of the PENNSYLVANIA LAWN MOWER has induced manufacturers of other Lawn Mowers to imitate our open cylinder. Not being able to use the Patents upon which our knives are formed, they all make a bungling attempt to try and accomplish the same result, in trying to secure the same cutting edge on the knives by a different shaped edge which after being in use a short time, reduces the edge of the knife to cause great friction, and without securing the desired results.



Has No Equal,

Surpassing All Others

AND PROVED

"THE BEST."

Illustrated Price Lists sent upon application.

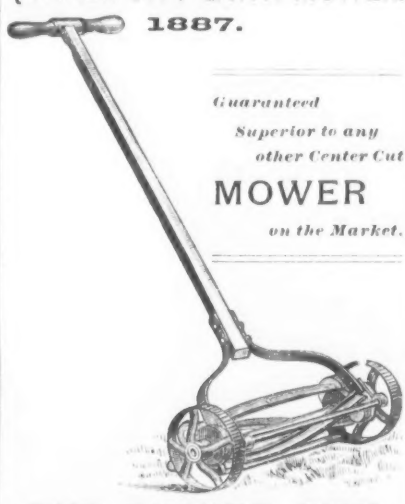
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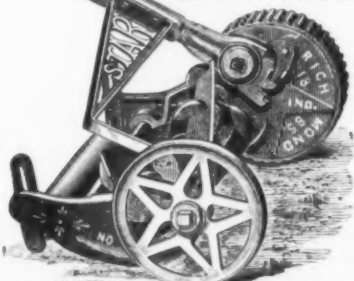
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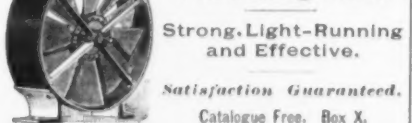
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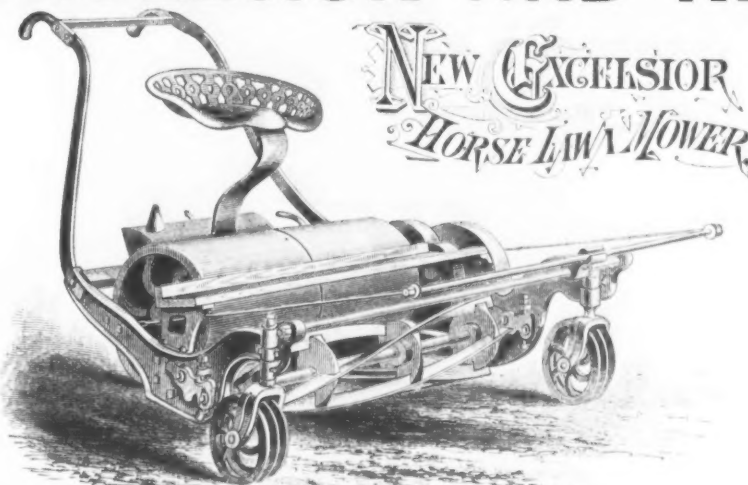
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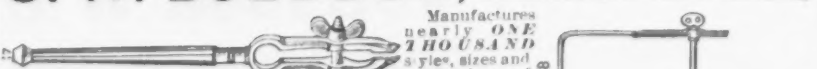
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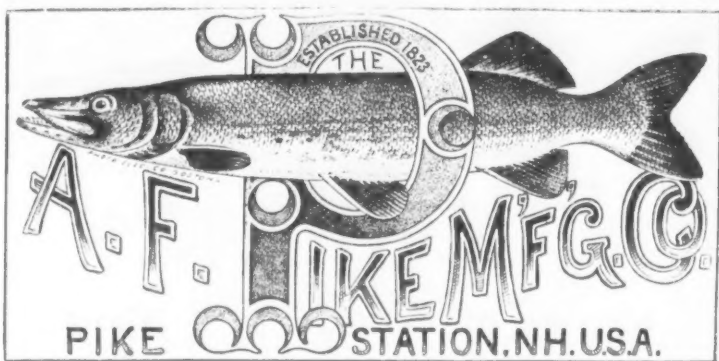
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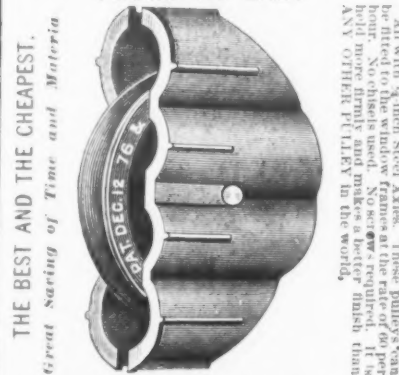
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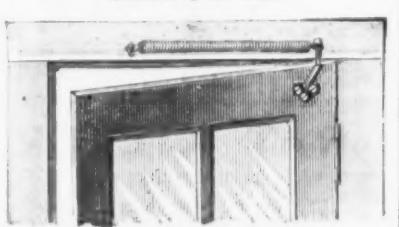
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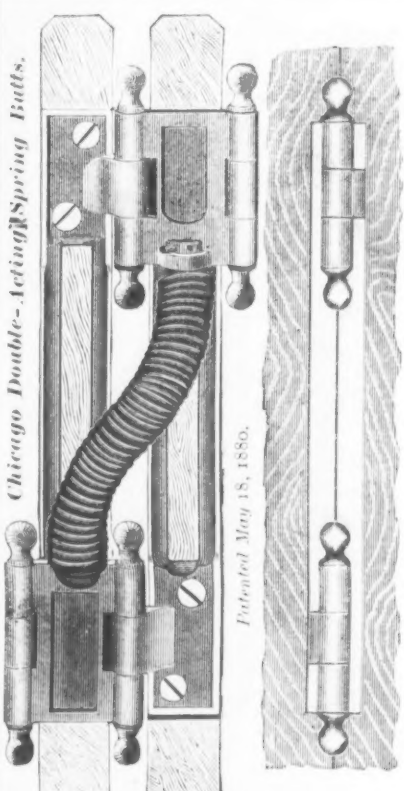
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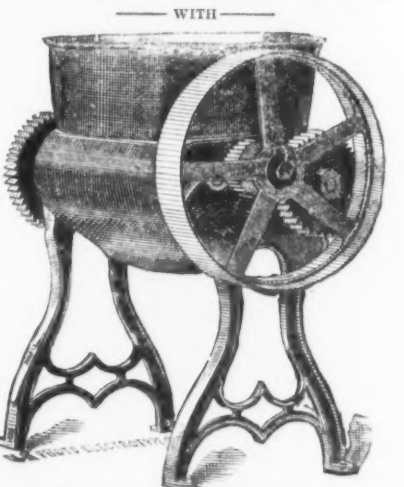
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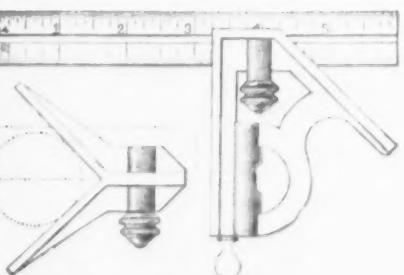
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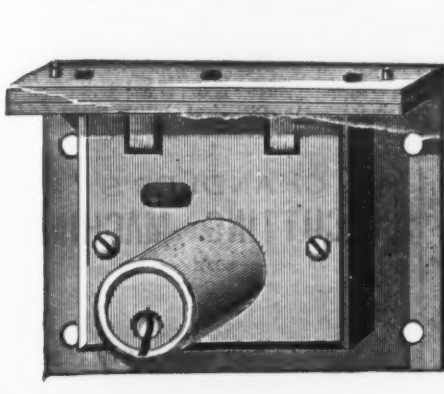
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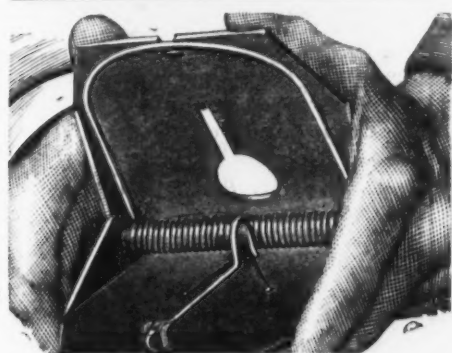


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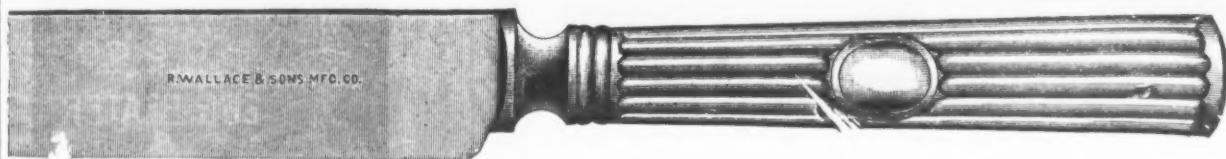
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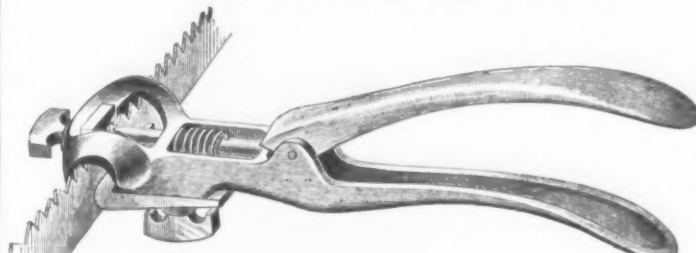


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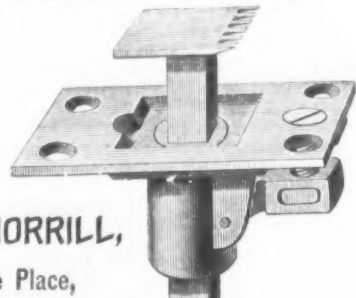
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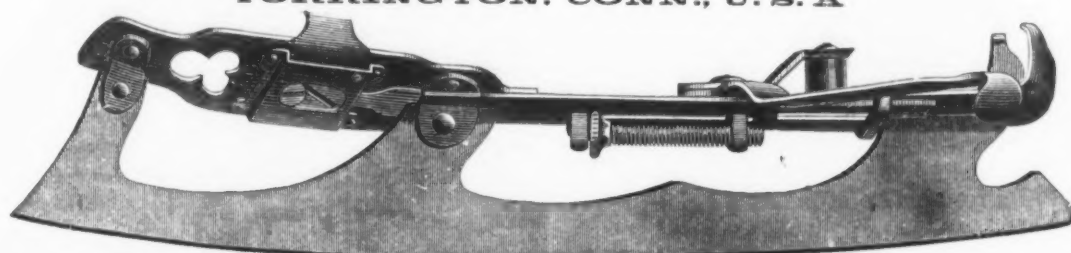
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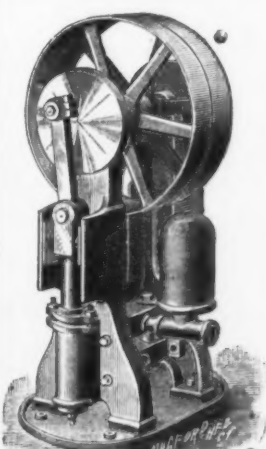
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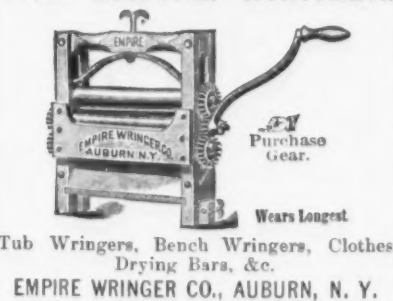


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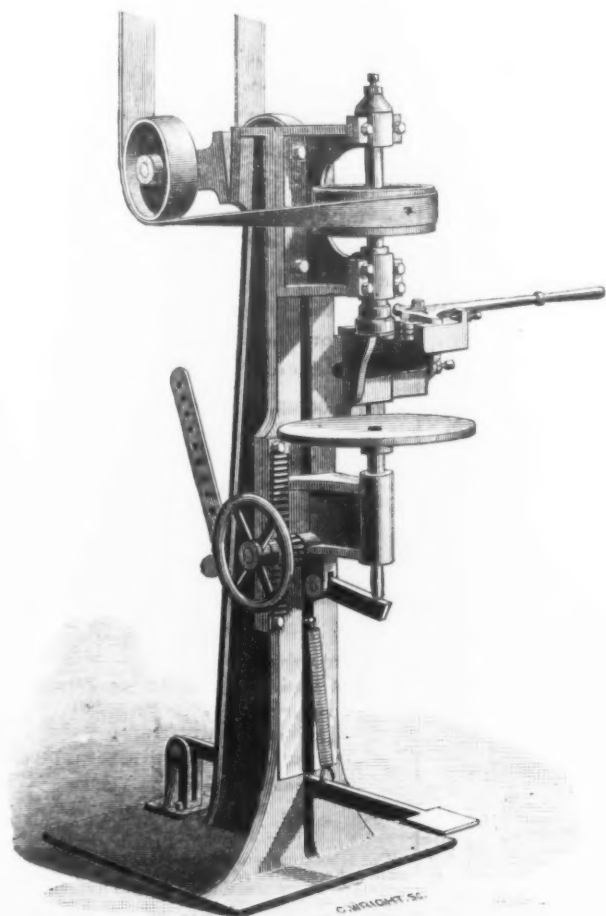
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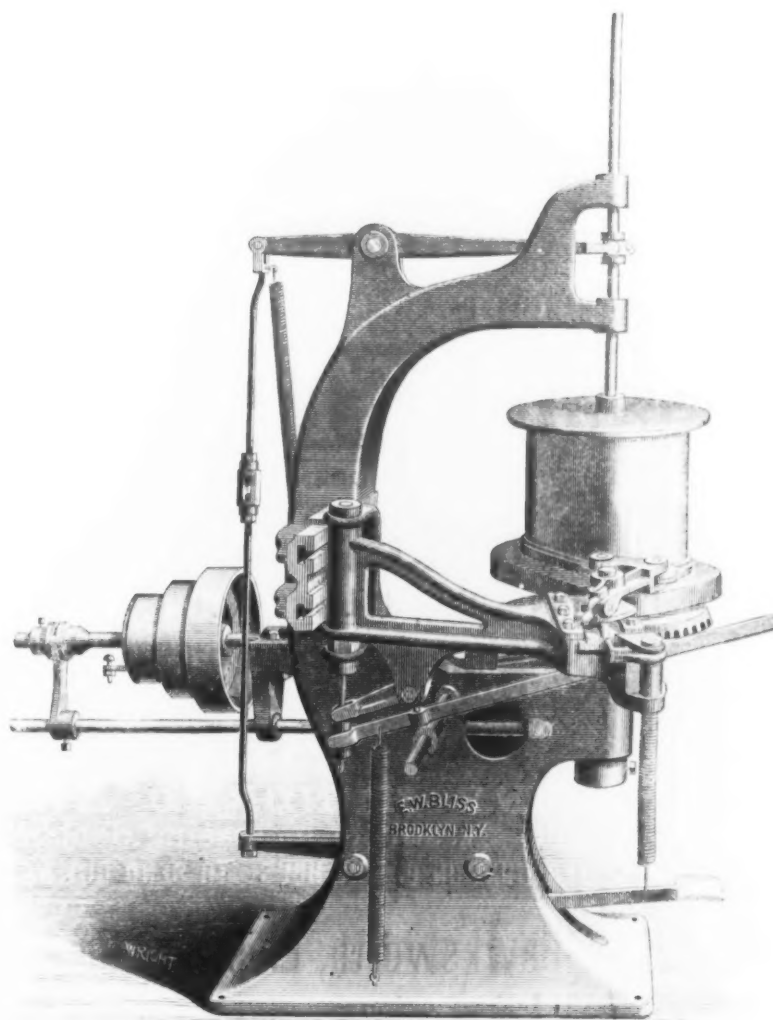
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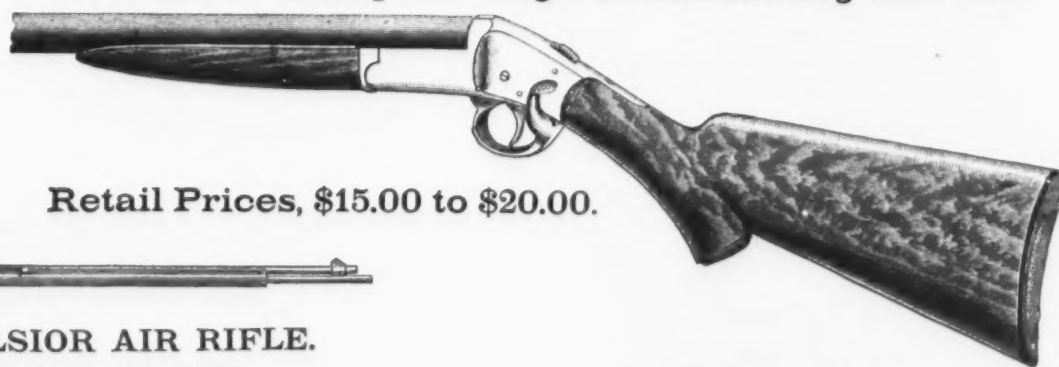
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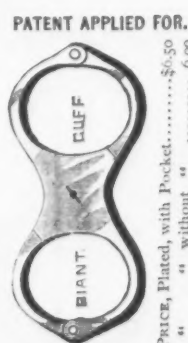
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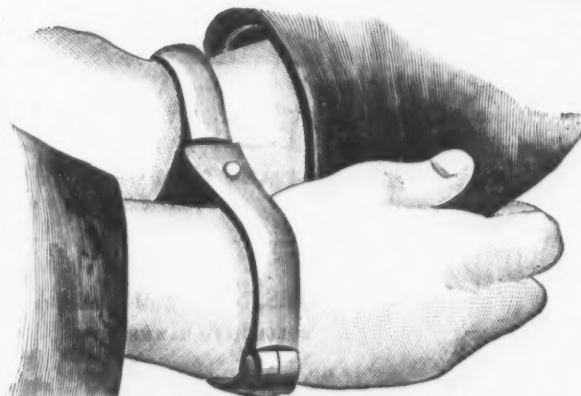
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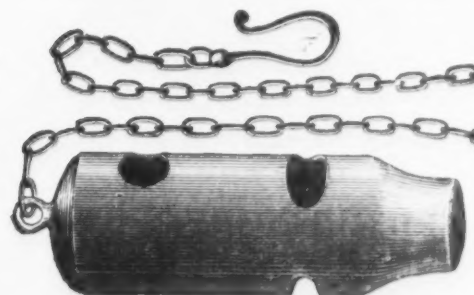


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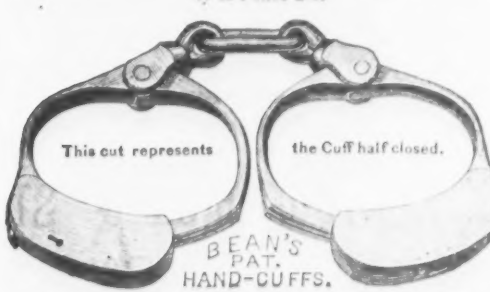
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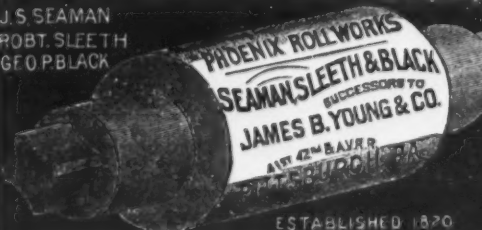
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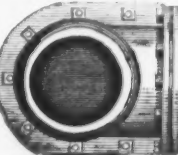
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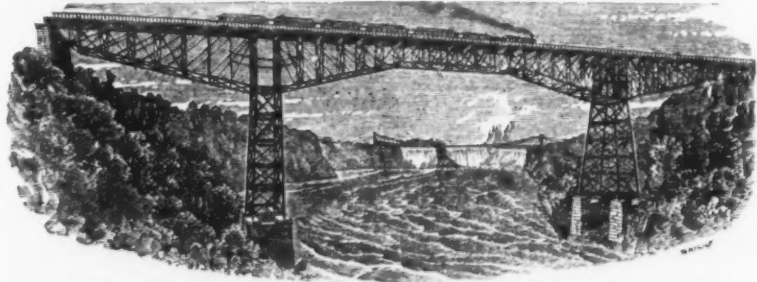
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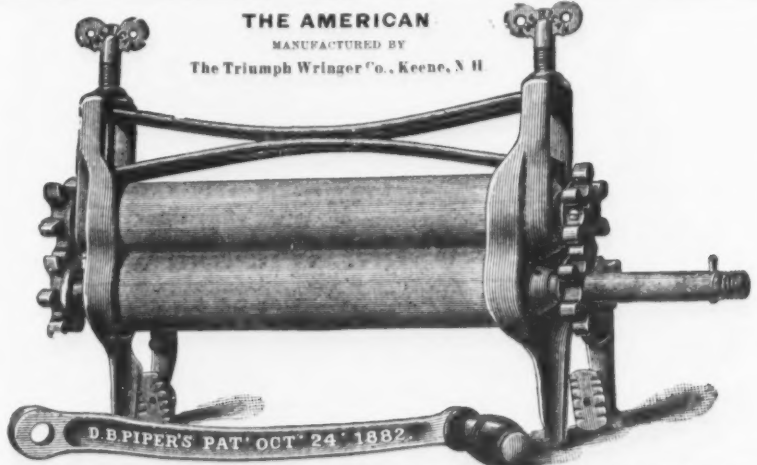
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FIRE BRICK.

BEST AND CHEAPEST.
ESTABLISHED 1845.
Office, Foot of Houston Street, East River, NEW YORK.

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ALBANY, N. Y.,
MANUFACTURERS OF BEST QUALITY
FIRE BRICK
And STOVE LININGS.

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MANUFACTURERS OF
FIRE BRICK
And FURNACE BLOCKS,
DRAIN PIPE AND LAND TILE,
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BORGNER & O'BRIEN,
MANUFACTURERS
FIRE BRICK
AND
Edge Pressed Furnace Blocks,
Clay Retorts, Tiles, &c.
Twenty-third Street, Above Race, PHILADELPHIA.
Twenty years' practical experience.

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TROY FIRE BRICK WORKS,
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James Ostrander & Son,
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Tiles, Blast Furnace Blocks, &c., and in a Special
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TILE & FURNACE BLOCKS,
OF ALL SHAPES AND SIZES
Miner and Shipper of "Mount Savage" Fire Clay.
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All dimensions of Firebricks and Shapes,
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WINDOW CLEANER.
The Best Window Cleaner now in the Market.
WHY?

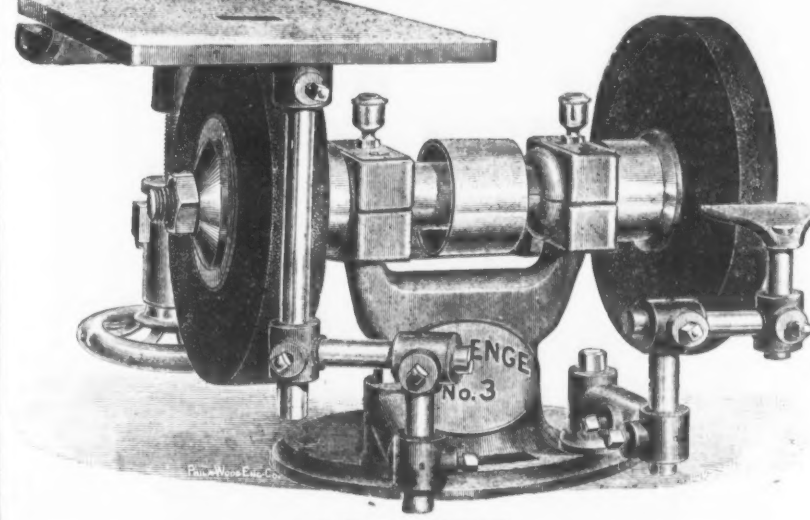
1st. It is so constructed that the Rubber can never
get out of the barrel without taking out the lock-pin.
2d. It differs from all other Rubber Window
Cleaners, for when the edge of the rubber is worn
smooth you can, by simply taking the pin out and re-
versing the edge of the rubber slip and pushing the
pin in again, have a new Window Rubber.
3d. It can be used twice again by taking the lock-
pin out and turning your rubber, using the near edge
of the rubber slip and placing it for the outside, then
reverse the whole thing again and you will have
equal to four Rubber Cleaners.
When the four edges are worn smooth and worth-
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strip of rubber for a few cents and place the rubber
in yourself. It is so simple that any child can do it.
For terms and prices address
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WE MANUFACTURE
8 Different Styles
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Our BARBER BRACE is made in 4
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in 3 grades, the cheapest finish being just as sub-
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No. 1 Grinder with surface grinding attachment. Size of Surface Plate 24 x 14 inches, for grinding
Die Plates, Flat Irons, Spirit Levels, Lock Fronts, Escutcheon Plates, Gibs and Keys. The machine
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Manufacturers of
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Long Ladders, Clothes Bars, &c.
Largest line of Step Ladders in the
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A practical means for
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House in the United States and Canada should
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PRICE, THREE DOLLARS.
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Made in several sizes in Steel and in fine polished Brass. The most perfect model for a sensible and
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Hooks and Bright Wire Goods in great variety. Specialties in Wire. Wire Nails of all kinds and sizes.
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RELIABLE
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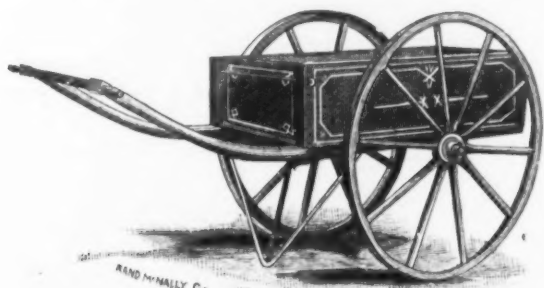
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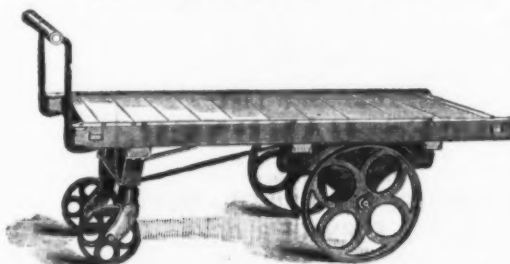
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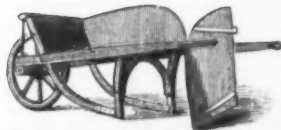


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THE REYNOLDS IMPROVED TRUCK.

Front Wheels Casters. Truck turns in its own length. Runs on or off elevator or scales at any angle. Is easily dumped by lifting handle. Any size. Send for circular.



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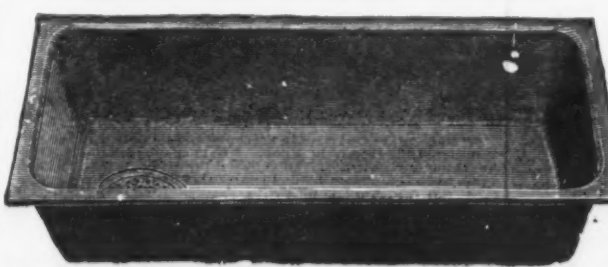
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Entirely new, being stamped from one plate of steel and superior to cast-iron sinks in every particular, being tighter, stronger and more durable.

These sinks, being made of wrought steel, will not break from heat, cold, or any cause whatever.

We furnish these sinks painted or galvanized, as desired, at prices—freedom from breakage considered—less than for sinks made from cast iron.



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Bristol Patent Truck

Simple—Durable—Labor-Saving.

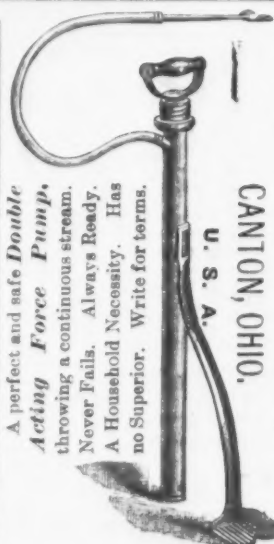
This Truck is adapted for handling all kinds of packages, barrels, boxes, &c., &c. FOR FACTORY USE IT IS UNEQUALLED

DEMING MACHINE CO. Gentlemen—The four Handy Trucks of your make which we have in use give excellent satisfaction. On a smooth floor a man can move a half ton cask of wire on one of them with one hand. Yours truly, WATERBURY BRASS CO. WATERBURY, CONN.

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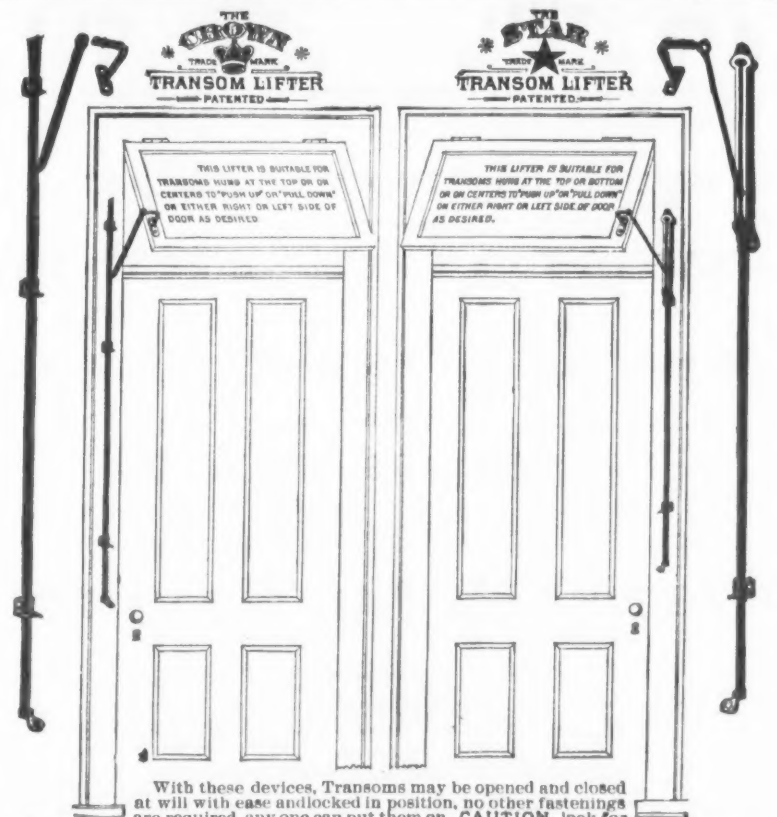
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Also maker of Iron Draw Benches for Brass and Copper Tubing, Power Presses, Special Attachments, Spinning Lathes, Slitting Machines and Rivet Machines.



COMET LAWN FORCE PUMP,
CANTON, OHIO,
U. S. A.

Pat. June 23, 1885.
Mercantile Manufacturing Co.,
CANTON, OHIO,
U. S. A.



With these devices, Transoms may be opened and closed at will with ease; unlocked in position, no other fastenings are required, any one can put them on. CAUTION, look for the Trade Mark on the handles. We are now prepared to fill orders for the "Crown" and "Star" Lifters, in such sizes as are listed below, which are suitable for house and office transoms, and hope soon to announce our ability to supply sizes for store transoms.

Price List "Crown" Lifters.				LIST.				Price List "Star" Lifters.			
No.	Length	Size of Rod.	Price Each.	APRIL 8th	No.	Length	Size of Rod.	Price Each.	No.	Length	Size of Rod.
43	3 feet	3/8 x 1/2	Bronzed Iron, \$0.55	1886.	83	3 feet	3/8 x 1/2	Bronzed Iron, \$0.70			
44	4 "	" "	" " 0.65		84	4 "	" "	" " 0.80			
45	5 "	" "	" " 0.75		85	5 "	" "	" " 0.90			
43 1/2	3 "	" "	Nickel Plated, 1.75		83 1/2	3 "	" "	Nickel Plated, 2.00			
44 1/2	4 "	" "	" " 2.00		84 1/2	4 "	" "	" " 2.25			
45 1/2	5 "	" "	" " 2.25		85 1/2	5 "	" "	" " 2.50			

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—MANUFACTURERS OF—

WIRE NAILS.

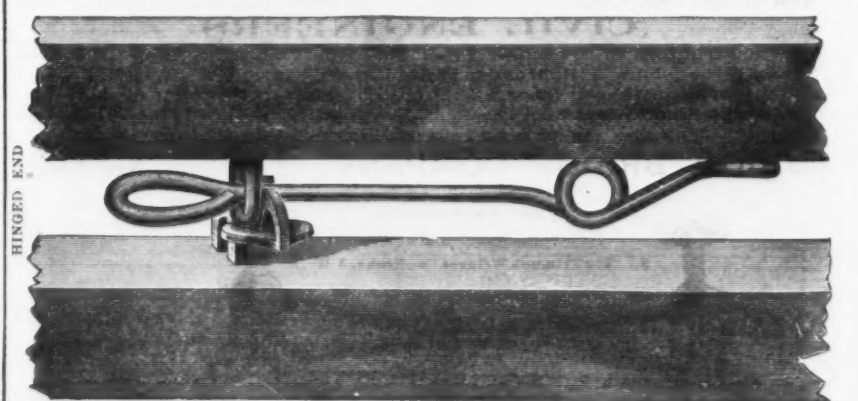


The above Cut represents the Effect on Wood of a Cut Nail and a pointed Steel Wire Nail.

SHEDD'S STEEL SPRING WIRE BLIND FASTS,

FOR WOOD OR BRICK.

Write for Prices.



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Maple Wood Body—High Polished, with Leather Lining. For Sale in every City by the leading Jobbing Trade. This celebrated Faucet is unequalled by none. The only standard Faucet suitable to use for Wine, Liquors, Beer, Ale or Vinegar, which will not form verdigris. They are put through a patent process which makes them impervious. Beware of imitations, such as keys made of lead, iron and other inferior metals, nickel, which will in every instance form poisonous metallic corrosion. None genuine unless stamped thus: John Sommer's Best Block Tin Key Faucets.



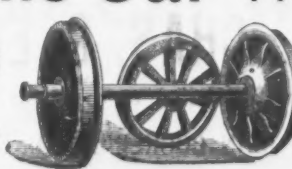
We will send sample dozen of Barrel Size to any one in the trade, express prepaid, for \$4.00, with sample Card of different sizes.

World known John Sommer's First Quality Cork Liner Faucets, all labeled with the name. Everything in the Wood Faucet Line. Diamond Lock Faucets, Rosewood Faucets with Block Tin Key, Rosewood Faucets, all wood, Maple Wood Faucets boiled in wax, Lignumvite Key Faucets, Cherry Faucets, Butternut, Black Walnut, Locust and Red Cedar Faucets.

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Manufacturers of
CHILLED WHEELS
OF ALL KINDS,
With or Without Axles.
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Cold Blast
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IS USED EXCLUSIVELY BY
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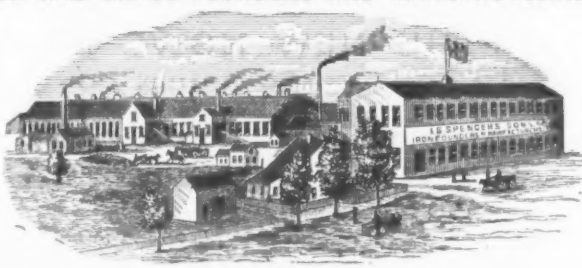
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Light and medium weight
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All kinds of light machine work, patented articles, fancy and light hardware, and wood and metal patterns made from samples or drawings. Japanning and Nickel, Bronze, Brass and Copper Plating a specialty. Extra facilities for annealing. Full capacity, 12 tons per day. Correspondence or Interview Solicited.

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Manufactured from very best SWEDISH METAL. Will not split. Are accurately pointed, tough, strong and hold the shoes. Soft enough to clinch readily; stiff enough to drive without bending. All nails uniform and perfect. They are used in thousands of shops with the best of satisfaction, and are especially liked by "floor-men" for their good, reliable driving.

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FOR
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BED SURFACER.

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Price, \$3.00.

or Light or Heavy Molasses, Oils,
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We warrant these Faucets to be as represented, measuring correctly and working more easily in heavy molasses than any measuring faucet in the market. No grocer can afford to be without them, for they save time, and "time is money." They insure perfect cleanliness, requiring no tin measures or funnel to collect dirt and draw flies. They do not drip. They prevent all waste, as no molasses or other fluid can pass except when the crank is turned. They are the embodiment of simplicity, and consequently they are always in order. They work easily in the heaviest molasses. They are warranted to measure correctly, according to U. S. Standard.

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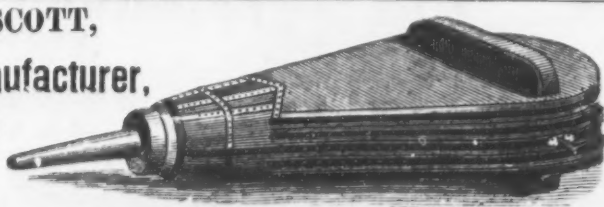
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From 3-4 in. to 10
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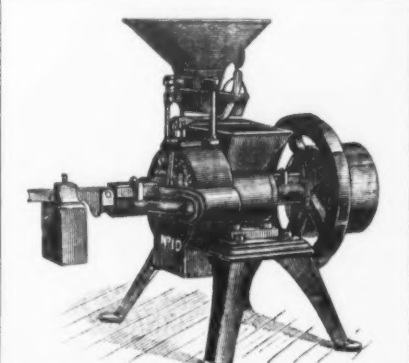
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Manufacturers of
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GRINDING WET, GREEN, GREASY OR DRY BONES.

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They can be seen in operation in last named
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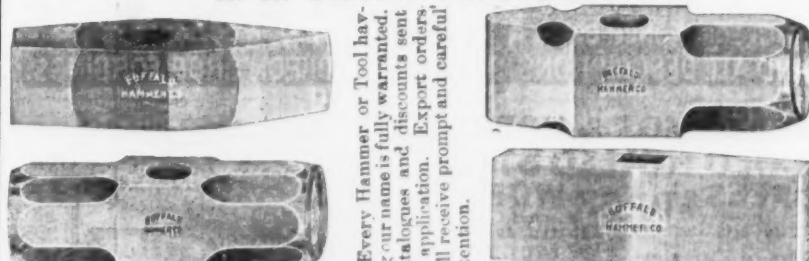
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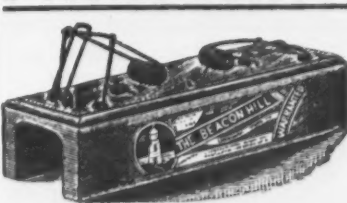
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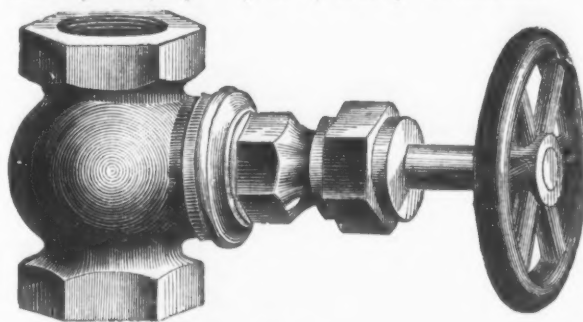


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Special care has been taken in the manufacture of this Wheel to avoid danger from bursting and secure uniform density. It is a free and rapid cut, and a desirable Wheel for persons whose work requires a Wheel to run as cool as possible when run dry. It makes a clean, brilliant cut, which will be found desirable for many classes of work.

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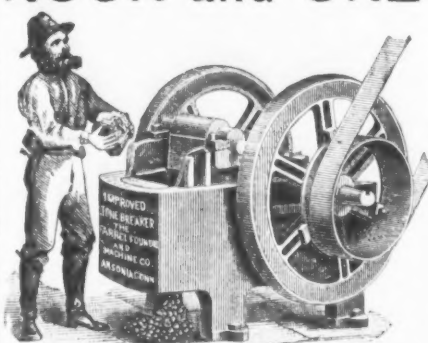
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WIRE NAIL MACHINES.

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ROCK and ORE BREAKERS and CRUSHERS.



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This style of Rock Breaker, after 15 years' practical test at HOME and ABROAD, has proved to be the best ever designed for the purpose of breaking all kinds of hard and brittle substances, such as
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ALSO FOR MAKING
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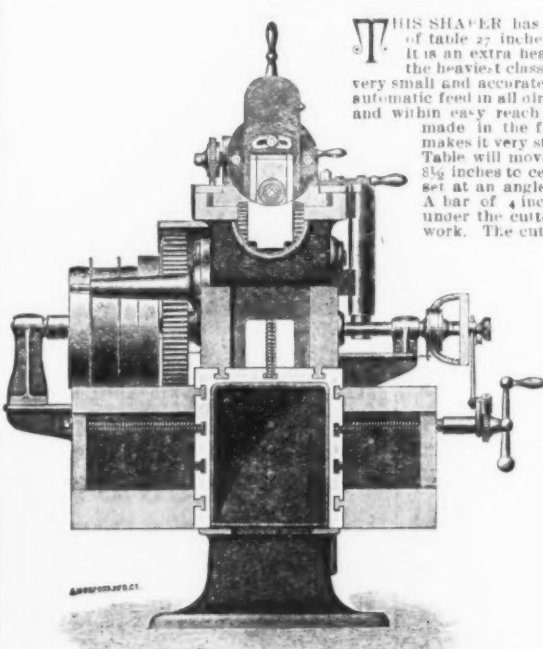
Mr. S. L. MARDEN, who for the past 20 years has been connected with the manufacture of the "Blake Crusher," superintends the making of the machine.
Gold Medal awarded at the Massachusetts Mechanic Association, 1881, and Silver Medal (Special) at American Institute, New York, 1882. Address

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WELDED CHROME STEEL & IRON (5 PLY) FOR SAFES VALVE & S CHROME STEEL WORKS BROOKLYN E.D.N.Y.



NEW 25-INCH SHAPER.



THIS SHAPER has a stroke of 25 inches, cross feed of table 27 inches, and will plane 20 inches high. It is an extra heavy machine, and is designed for the heaviest class of work, while at the same time very small and accurate work may be done on it. It has automatic feed in all directions, very simple in operation, and within easy reach of the operator. The table is made in the form of a four-sided box, which makes it very strong and solid under a heavy cut. Table will move to the left far enough to take in 8 1/2 inches to center of machine, and tool can be set at an angle to plane to or 11 inches wide. A bar of 4 inch iron may be passed through under the cutter bar for key-seating or other work. The cutter bar is driven by two rack gears of large diameter, on a heavy steel shaft supported on bearings at each end. Driving pinion and gear are on the outside of the machine, allowing the use of extra large gear and increased speed of pulleys, and consequent gain of power on cutter bar. All pinions made of best machine steel.

Driving and feed shafts have extra outside bearings or supports.
The machine has patent improved friction driving movement, and we guarantee cutter bar to work up to a line and reverse without jar or noise.
Weight of Machine, 2200 pounds.
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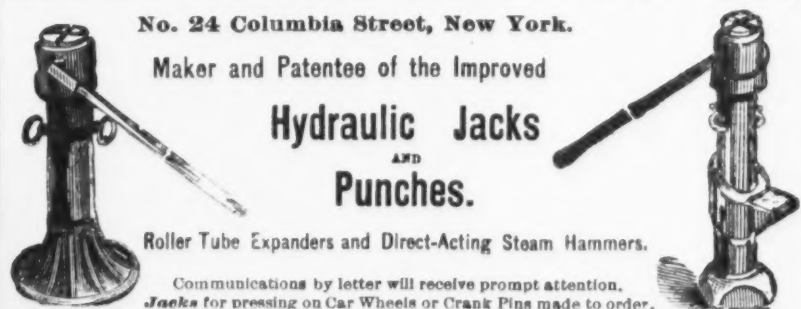
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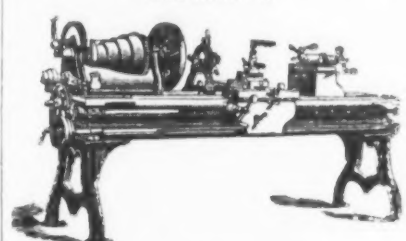
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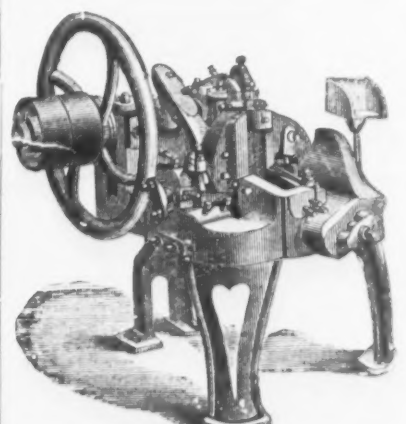
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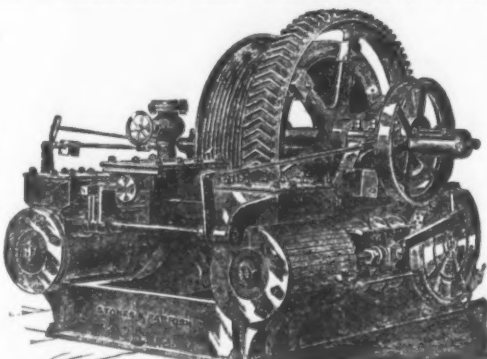


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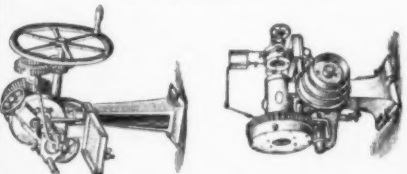
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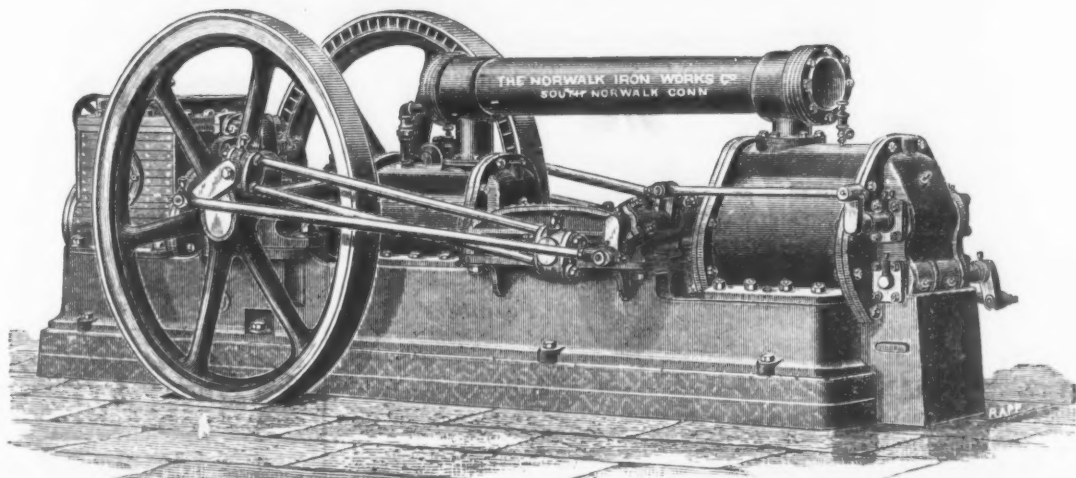


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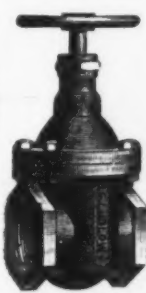
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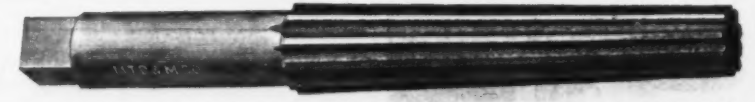
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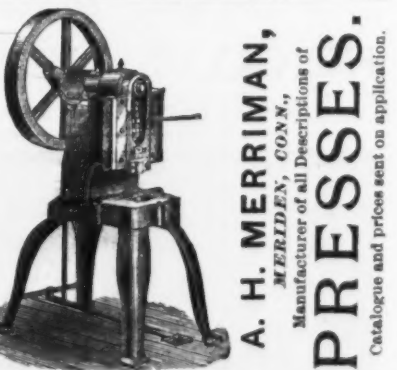


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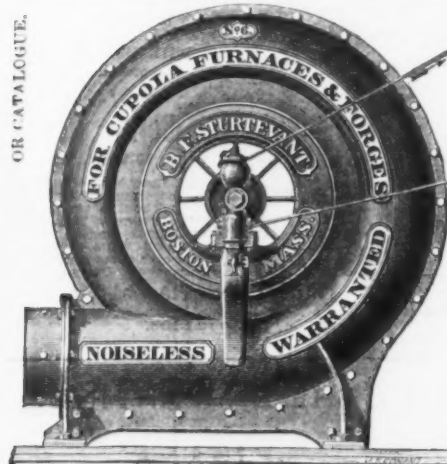
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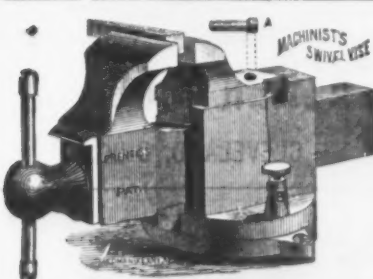
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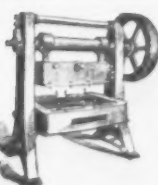
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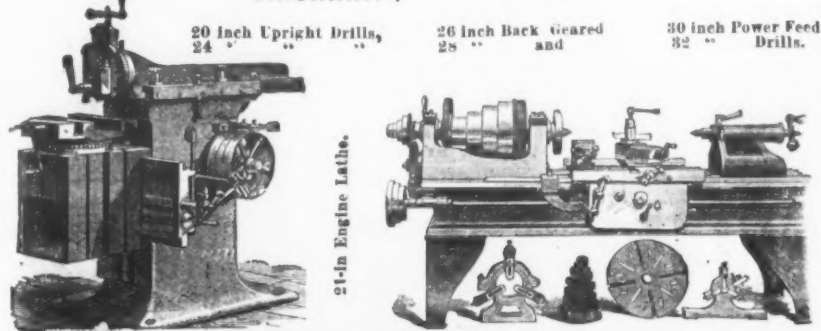
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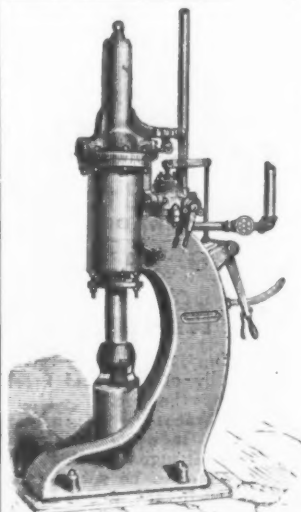
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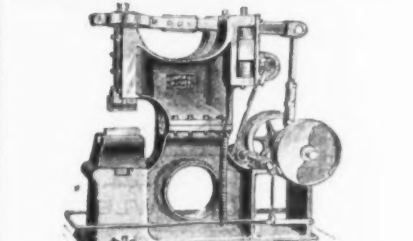
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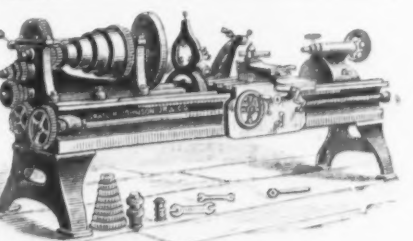
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